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Sri A. B. Shetty
MINISTER FOR HEALTH,
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15 NOV 1958

ABOUT OURSELVES

It is with trepidation that we place before you the inaugural number of the Madurai Maedical College Magazine.

The Madurai Medical College had a chequered beginning. Its start was contemplated by the Government of Madras in 1947 and Dr. R. Mahadevan, an eminent Surgeon attached to the Erskine Hospital, Madurai, was appointed as Special Officer to do the necessary spade work. Meanwhile, the College was given a flying start by admitting 30 students in its rolls at the Madras Medical College. A skeleton staff for the Anatomy and Physiology Departments was appointed to function at the Madras Medical College.

In 1948, the scheme was precipitatedly dropped for reasons unknown to us and the students and equipment were donated to the Stanley Medical College and the staff redistributed to existing Medical Colleges in the metropolis. Thus ended the first chapter in the history of the Madurai Medical College.

In 1953 the separation of the Andhra Province was a powerful fillip for the resurrection of the old scheme. A Special Officer, Dr. K. P. Sarathy was hurriedly appointed and budget allotments were made with lightning rapidity. Dr. Sarathy arrived in Madurai on the 15th of March 1954 and when he visited the proposed site for the Medical College, he could see only temporary sheds. He recorded his first impressions in these words "........... a chill swept through me and I was feeling upset because I began to doubt whether the College could be started in such a short time as July 1954". Undaunted, Dr. Sarathy proceeded to achieve his goal with the unstinted assistance of the P.W.D. and the cooperation of the reputed medical men and public of Madurai. On the 11th of July 1954, his mission was complete and he handed over the Anatomy, Physiology, and Biochemisry Departments to the permanent Principal, Dr. (Smt) Sarah J. Souri.

On the 22nd of July the "first" batch of 50 students joined the College under its own roof. Their first job was to go ahead with all arrangements for the inauguration of the College on the 2nd of August 1954 by Smt. Rajakumari Amritkaur, Union Health Minister. The occasion was befitting the historic event. It is on record that no other event in recent years had evoked such happiness and enthusiasm from the public of Madura. On that day one of their long cherished dreams had come true.

During our emergence, we certainly have our own troubles and inconveniences. The laboratories are in semi-permanent sheds; the equipments are slow in arriving and there is shortage of staff in some of the Departments. But our hopes are high. The palatial buildings are nearing completion; the equipments designed to meet the requirments of the students and the research workers are of the most modern type: the Erskine Hospital where clinical training will be given in due course to the students is being extensively re-modelled and reorganised, spacious sites have been acquired for the construction of Maternity and Mental Hospitals; 10 acres of

land adjoining the College have been dearmarked for the playgrounds including a 400 meter track. We have no doubt that when all things take shape, the Madurai Medical College will certainly be one of the finest Medical Colleges in India. The progress of growth of this College is being watched with parental affection by the Government and the people. Any expression of gratitude to the sponsors of the College, Sri A. B. Shetty, Hon'ble Minister for Health, Government of Madras and Lt. Col. Sangham lal, Director of Medical Services, Madras, will be hopelessly inadequate. Their real thanks will come from the thousands of fellow-men who will be benifitted by the graduates of this College and by the aspiring students who now have an added opportunity in this part of India to acquire an upto-date training in modern medicine in the most modern way.

The 50 students who form the first batch of this College, have a very arduous duty to perform. Enthusiastic in their work and keen to learn, they have excelled themselves in a variety of extramural activities and it can be predicted with confidence that noble traditions will be set up for the generations of students yet to come.

We take pride in the fact that we are able to publish this issue during the very first year of the inception of the College. Our heartfelt thanks are due to our Principal, Dr. (Smt) Sarah J. Souri, for the advice, guidance and encouragement at every stage of its publication. The first Vice-President of the Magazine Committee, Dr. C. Venkata Ramiah, although no longer with us, will always be remembered as the one who gave the issue a shape. We are grateful to the members of the staff and students for their co-operation and contributions to this issue. Our special thanks are due to the many firms which readily acceeded to our request by encouraging us with their advertisement and thereby providing us with the necessary financial assistance. We should like to express our gratitude to the "Hindu" who so kindly gave their permission to reproduce the report on the inaguration of the College. Lastly, it is a pleasure to thank the Asoka Printers for their splendid co-operation and technical assistance, and the promptness with which they brought out the issue.

Vice-President,

Magazine Association.

JAI HIND !

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" OUR PRINCIPAL "

Dr. (Mrs.) Sarah J. Souri, M B., B.S , D.G.O., PH.D.

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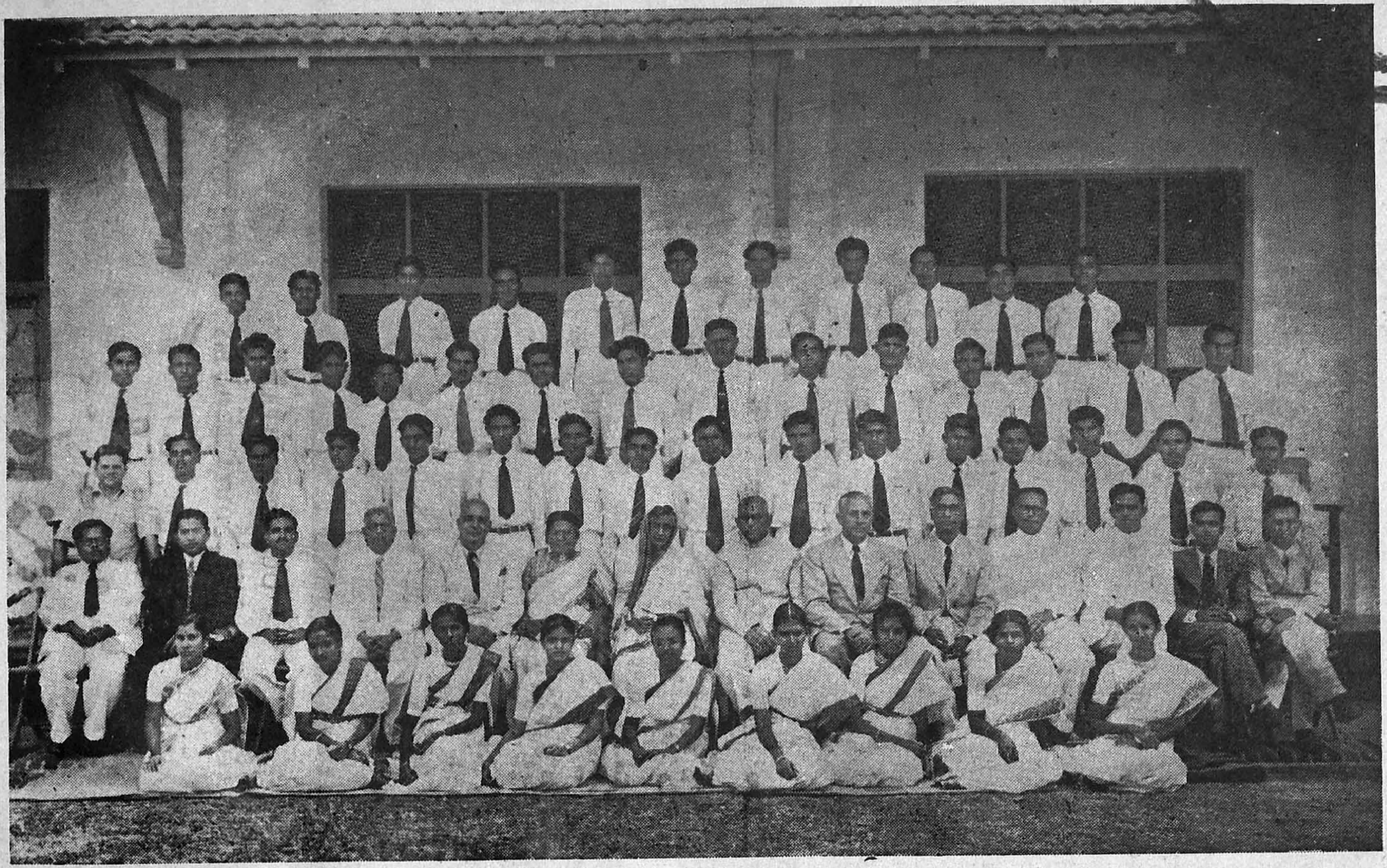

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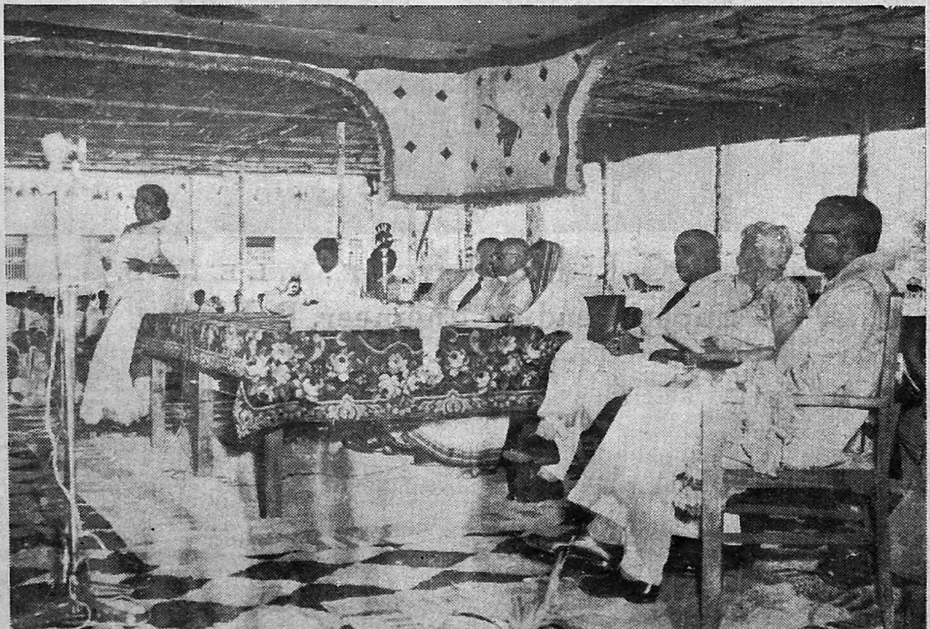
Guard of honour presented to Smt. Rajkumari Amrit Kaur Union Health Minister on her arrival for the Inauguration Ceremony



Dr. (Smt.) Sarah J. Souri, the Principal Welcoming the gathering

15 NOV 1958

THE MADURAI MEDICAL COLLEGE, MADURAI.

REPORT OF THE INAUGURATION DAY CELEBRATIONS.

Monday, the 2nd, August, 1954 was a red letter day in the history of Madura, in that the inauguration of a new Medical College took place on that day. About the celebrations "The Hindu" writes :—

Madurai, Aug. 2.

"Smt. Rajkumari Amrit Kaur, Union Health Minister, declared open this morning the new Madurai Medical College, Mr. A. B. Shetty, State Minister for Health, presided over the function which was attended by a large gathering of officials and non-officials.

The Madurai Medical College will be the third medical college in the state, run by the state Government.

The spacious eleven-acre campus of the college presented a festive appearance, bedecked with flags and festoons. The function was held in the specially-erected pandal in front of the college.

The function began with prayer by the lady students — Miss. Kamala, Miss. Vijayalakshmi & Miss. Sangeetham.

Dr. (Srimathi) Sarah J. Souri, Principal of the College, welcoming the guests, said that this Medical College had commenced the pre-clinical course of studies, which extended to 18 months. The pre-clinical departments, she said should, besides training undergraduates, provide facilities for training post-graduate students. She also pleaded for facilities being made available for building up interest in research. Unless the pre-clinical staff was permitted to devote total attention to teaching and research, the pre-clinical laboratories would become altogether mechanical, resulting in stagnation. She hoped the authorities would take a farsighted view of this fact. In conclusion, she expressed the hope that this college would surpass others in seeking to discover hidden biological truths.

Lt.-Col. Sangham Lal, State Director of Medical Services, reviewed what he called the rather chequred history of this college which was proposed and planned as early as 1946 and referred to the difficulties experienced in getting non-clinical teachers for medical institution because of the poor attraction the profession offered. He said more and more medical institutions were springing up everywhere but there was not enough qualified staff available. It had become a serious problem to get energetic teaching staff. The only solution for this emergency, he said, was the immediate institution of a uniform and attractive scale of pay and allowances for non clinical teaching staff with more facilities and better recognition. He hoped the Union Health Minister would take up this question with all the State Governments and see that something was done immediately.

Thanking the Madurai Municipality for the help they had given in starting this College, he said they

still had to play a leading part in its future development.

Dr. T. Narayanaswami, Tutor in Anatomy, read messages of good wishes received on the occasion from Dr. S. Radhakrishnan, Vice-President of India, the Governor of Madras, Dr. C. S. Patel, Dr. A. Lakshmanaswami Mudaliar, Vice-Chancellor of Madras University, Dr. P. V. Cherian, Dr. U. Krishna Rao and the Indian Medical Association.

Dr. Venkataramayya, Professor of Physiology, proposed a vote of thanks.

Mr. A. B. Shetty's Address

Mr. A. B. Shetty, in the course of his Presidential address said, "The Central Government collaborate with the State Governments in the task of improving under-graduate medical education and they bear the responsibility for maintaining proper standards in post-graduate education and training. The participation of the Union Minister of Health in this function is therefore a matter of encouragement to us. The Health Survey and Development Committee in their report published in 1946 have pointed out the grave shortage of doctors and other types of health personnel in our country and recommended that so far as this State is concerned, three more medical colleges should be established within 10 years, one at Madurai and the other two at Coimbatore and Kozhikode. We have to go slow in this matter, as our resources in men and money are limited. The establishment of a medical college with a large hospital attached to it is a very expensive undertaking. What is more difficult is to find for it adequate and competent medical staff and auxiliary personnel.

"A short time ago the British Medical Journal wrote about the ever-growing numbers of the medical profession in Britain and the limited scope available for their work in their country or for practice abroad. There is a growing doubt in U. K. about the utility of spending the resources of the State on training large numbers of medical students without relating supply to demand. The problem of "Too Many Doctors" has not yet arisen in our country. Competition is, however, becoming keener every day among the medical practitioners in cities and larger towns. Other rivals in the field are the numerous unqualified practitioners who offer cheaper service and promise quicker cure. The quacks in every country find unlimited opportunities in the gullibility of the human mind.

"The medical course is long and expensive, costing on an average Rs. 9,000 to Rs. 10,000 per student. It is by no means an easy job to get over the examination hurdles. Hardly 20 per cent of the students on an average are able to get through the course without failure at one stage or another. Yet a medical career is very much coveted at present. The profession of medicine seems to offer fairly good material prospects and a social status of high order. One can earn an independent living even if no employment is found under Government The number seeking admission to Medical Colleges is far in excess of the places available. It is so even in other countries where they have many more medical schools. This year 1,121 applications were received in Madras and 909 of the candidates came for the

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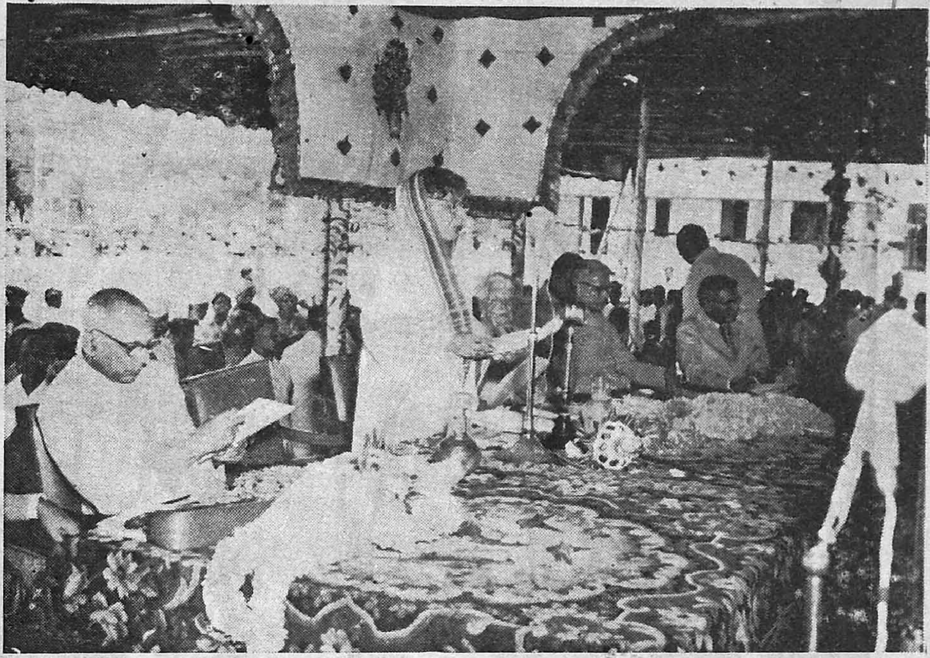
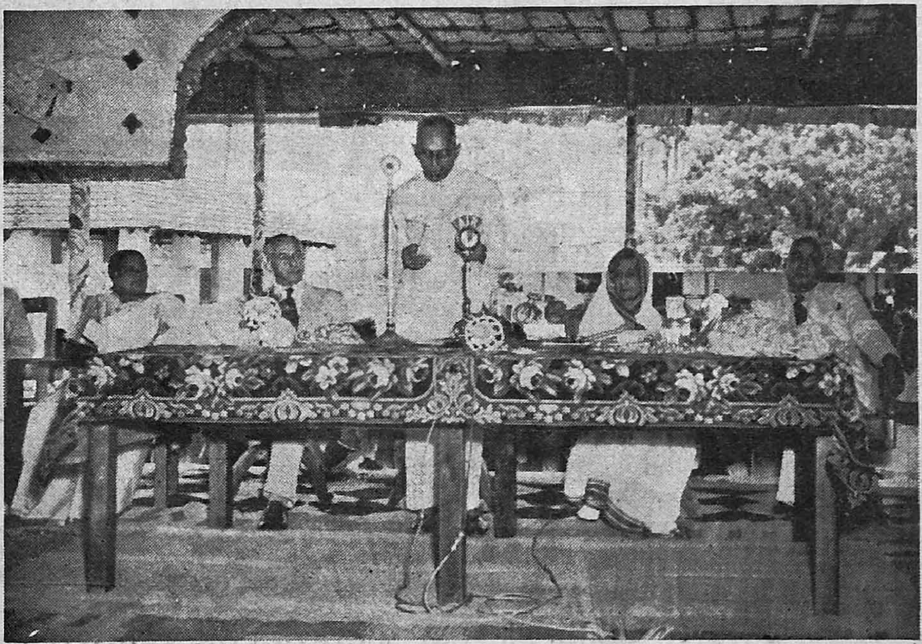


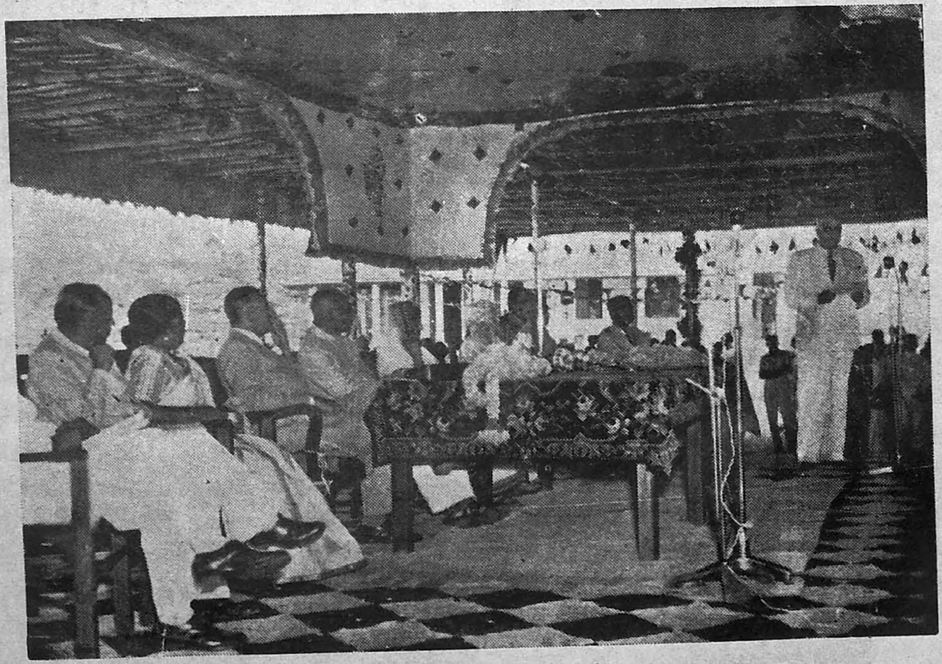
Smt. Rajkumari Amrit Kaur,
Union Minister for Health, addressing the gathering



Sri A. B. Shetty, State Minister for Health, Madras,
reading the Presidential address

16 NOV 1956

Smt. Rajkumari Amrit Kaur,
presses the switch, which formally opened
the portals of the College



Lt. Col. Sangham Lal addresses the gathering

interview. Two hundred and ninety-five of the applicants including 67 women have been given admission in the two colleges in Madras City and in the new college started here In no other State in India such a large percentage of women students seem to get admission to the medical colleges. Among the candidates admitted this year, about 45 per cent belong to the backward classes, though only 25 per cent of the seats are reserved for them. Social justice has thus been done to a large section of the community whose interests have to be safeguarded by the State.

"The task of selecting medical students was done by means of an interview by a committee of three medical men who have had experience of medical education. Certain qualities are needed to make a student fit to take up such a very exacting profession as that of medicine. Expert bodies on medical education in the United Kingdom as well as here have expressed the view that examination marks should not be the sole criterion for selecting students. Mere academic qualification is not enough. The student should have the requisite aptitude, general ability, physical stamina and certain character traits. It is generally agreed that in the assessment of fitness, due weight should be given to the candidate's personality and character. The share taken by him in the extra-curricular activities of the college, such as debating societies, sports, scouting and social service activities give a fair indication of a student's social usefulness.

"Medicine has become an international profession. Our teaching institutions have to maintain high standards and keep up to the international level. We should have for this purpose teaching personnel of high qualifications and teaching capabilities. The All India Medical Institute to be set up at Delhi will become a centre for training medical teachers of the required calibre. Till then it may be advisable to obtain the services of competent professors from abroad on short-term contract. Modern educational methods require a high ratio of teachers to students so as to give effective personal attention and guidance.

"The problem of finding adequate and suitable teaching personnel for non-clinical subjects has become a serious one at present. The professors are having too few Assistants and the number of students is too large for effective teaching. This may be partly responsible for the high Mortality in medical examination. If higher salaries can be paid, better type of men can be recruited to the teaching posts in adequate numbers Another solution is the extension of the retirement age for professors from 55 to 60 or so. The WHO team of medical scientists who visited Madras in the early part of last year have expressed the view that to retire medical teachers at the age of 55, when they have attained the height of their experience and didactic capacity amounts to the wasting of precious teaching talent. In a country which requires teachers so badly, the early retirement of the present good teachers appeared to them to be an extravagance. In Madras, the existing incumbents of non-clinical professors' posts are now being re-employed upto the age of 60. The best among the professors who retire from our service are offered jobs in the medical colleges of some other States on very attractive terms. Another phase of medical education which requires

particular attention is the better organisation of research work in our teaching centres. An atmosphere of research will improve the quality of teaching and also make the students more scientific minded in their approach to medical problems.

"Medicine is a continually expanding science. The medical curriculum and the methods of education and training need, therefore, constant re-examination and readjustment to the changing ideas and practices in medicine. Medical education in any one area must to some extent, be related to the medical needs of that area. In a report made to the Ford Foundation in 1952. John Bowers has pointed out that the basic medical problem in India to-day is rural health—particularly the field of hygiene and preventive medicine. Unfortunately this subject holds definitely a secondary position in the typical medical college curriculum and the minds of many physicians

"A reorientation of the curriculam and a change in the attitude of medical educators and practitioners are quite essential if we are to tackle better the really significant problems of health and medical care in the villages. The curriculum in our medical colleges has to lay special emphasis on nutritional and tropical diseases, particularly those common in India. It has been suggested that the medical course should include compulsory rural medical work. This will enable the students to have proper appreciation of the home conditions and rural environments in which the majority of our people live and thus make them better fitted for the work of a general practitioner.

"The conception of a "Basic Doctor" as visualised in the Bhore Committee Report fits in with the modern trends in medicine. The basic doctor's training has to give special emphasis to the preventive aspects of medicine. Preventive medicine has been continuously extending the range of its activities in the past few years. The development of the idea of. socical medicine is one of the significant advances in recent times. The present day concepts of preventive and social medicine have enlarged the boundaries of medical thought and practice. The important place to be given to the subject of "Preventive and Social Medicine" in the under-graduate curriculum evoked special interest at the World Conference on Medical Education which met in London last year. The Central Ministry of Health have taken a timely step in offering help to set up Departments of Preventive and Social Medicine in the medical colleges of some of the States. Those who are engaged in medical examination should direct the vision of their pupils to the widening horizons in medicine and inspire them to pursue the task of their great profession in a spirit of dedication.

"The establishment of this teaching institution will greatly improve the quality of medical relief in this centre and add to the importance of this place. The growth and development of this institution must therefore be a matter of special concern to all the people in this area. Rich men's contributions have built up many a great institution elsewhere. We hope and trust that the enlightened and wealthy citizens in this part of the country will give generous aid and co-operation in building up this institution.

Amrit Kaur's Address

The following is the full text of Rajkumari Amrit Kaur's speech:—

Ladies and Gentlemen,

"It gives me great pleasure to be present here to-day and to participate in this function. The starting of a new medical college means adding to the quota of the steadily increasing number of doctors the country is producing in order to develop its health programmes. Medical education is a field of activity in which the utmost possible collaboration is desirable between the States and the Centre, because the need for the attainment and maintenance of certain minimum standards of training throughout the country must be recognised as of paramount importance. Measures designed to achieve this purpose can be undertaken successfully only through a planned programme in which both the Centre and the States participate fully.

Of the 34 Medical Colleges in this country—I believe that this new college brings up the total of 34—25 are maintained by Governments and, even in the case of nearly all the remaining ones, varying amounts of governmental aid form part of their finances. In the circumstances it is clear that a policy of progressively improving medical education can be organised and sustained only by joint action by the Governments of the country. Such a policy must include not only legislative and administrative action to facilitate the enforcement of the desired standards but also the grant of generous financial assistance to medical colleges.

Medical education is perhaps the most costly type of education and the newer ideas, which are being incorporated in other countries in the medical curriculum and which are meant essentially to equip future doctors not only with adequate technical competence but also with knowledge regarding . community health problems, demand even higher levels of expenditure. The development of Preventive and Social Medicine as an essential part of the training programme for the medical student is of particular importance to India and in this and other important areas of advance in the field of medical education. It would be fatal for India to take up a halting attitude of complacency and refuse to move forward along with the rest of the progressive world. It is for these reasons that I have always felt that the subject of medical education has not received that measure of attention and support from public funds which it deserves. It may well be that this remark applies equally appropriately to education in general, but we as the custodians of health administration in this country are concerned primarily with this particular branch of education. I am glad that I have this opportunity to give expression to some of my views on the subject, because I feel that one essential step towards improvement is that all problems of national importance such as this should receive increasing attention from those who are in a position to contribute their share of helpful suggestions. It is in this spirit of thinking aloud that I am putting forward my own ideas.

A wise educationist of world-wide reputation, Dr. Alan Gregg who till quite recently was Vice-President of the Rockefeller Foundation, spent about four months in India, visiting medical colleges and other medical

institutions and interviewing health administrators and made a report on his impressions about India's medical educational problems in January, 1952. Among his recommendations the highest priority was given to the need to raise substantially the emoluments of teachers in medical colleges and to restrict severely their private practice. Another was to raise the age of retirement of these teachers to 60. Both these matters have been under active consideration by my Ministry. A proposal for creating a Central Cadre of teachers, which will include certain important posts in all medical colleges, towards the cost of which the Central Government will give financial support, has been with the State Governments for about four months now and a brief discussion of the subject took place at a Conference of Health Secretaries and Heads of Health Services in the States which was held in Delhi in April this year.

The proposal is at present in a tentative form and can be subjected to such modifications as may be considered necessary by the majority of the States. But I would urge that a scheme of this nature should be looked at from the constructive point of view and with the determination to shape it into a form which will be of lasting value to this country. Some measures of sacrifice of their present earnings may become inevitable in the case of a few Professors who draw large incomes from private practice, but this sacrifice should be accepted cheerfully as their contribution to the common cause of improving medical education in India and of promoting medical research. The proposal, if it goes through in the form in which it has been presented, should give incomes to teachers which are well above their present salaries and which should enable them to meet their obligations and live in comfort as well as make a reasonable margin of provision against unforeseen contingencies that may arise for additional expenditure.

I feel that Professors in our medical colleges should welcome such an offer which will help them to escape from the constant worries of private practice and research in order to obtain satisfaction through achievements in the professional field and not in the competitive world of scramble for money. I have always given the medical provision a very high, if not the highest place among the professions because no work could be greater than to relieve human suffering and nothing should be more satisfying to the giver than the thought of having been the means of reducing misery, both mental and physical. Is it too much to ask of our doctors to enter the profession from the point ef view of service to India in her hour of supreme need? To make her great in every sphere is surely the bounden duty of us all and well worth any sacrifice we can make on her behalf.

At the same time I would also plead specially with the State Governments that they should give sympathetic consideration to this proposal. They too must recognise that the labourer is worthy of his hire. Of course there will be difficulties but they can be met by compromise solutions if we start with the determination to ensure that the main purpose of the scheme must be fulfilled, namely, that each department of a medical college should be provided with a nucleus staff who are given reasonable emoluments and are thereby not dependent on private practice.

I hold that in this way alone can an improvement in the quality of the teaching given to the students be promoted and the necessary and adequate time for developing research provided. When it is remembered that the medical staff employed in large sectors of health administration have continued to work for years with complete prohibition of private practice, for example those engaged in preventive health work and in medical research. It is difficult to understand the justification for the resistance which certain doctors teaching clinical subjects are apt to put up to the proposal.

It would be wise for Governments to decide the question by taking into account the larger interests of the country and the potential good which improved medical teaching and research hold out and not on considerations from interested individuals or groups. The scheme will involve some additional expenditure to Governments, but there should be no hasty turning down of the proposal on this account. After full discussion between the Centre and the States an assessment of the probable rise in expenditure to individual Governments, over and above what the Centre may contribute, will become possible and before this picture emerges it would be wrong to make premature and hasty decisions.

Apart from the provision of a cadre of highly qualified teachers the Central Government is giving careful consideration to the question of making substantial grants to medical colleges for the purchase of equipment in order to enable their departments to improve their standards of performance. The intention is that, as far as may be practicable, financial and other difficulties which have in the past militated against the proper functioning of our medical teaching institutions should gradually be removed. In this task I do hope that the Central Government can look forward to full co-operation from State Governments.

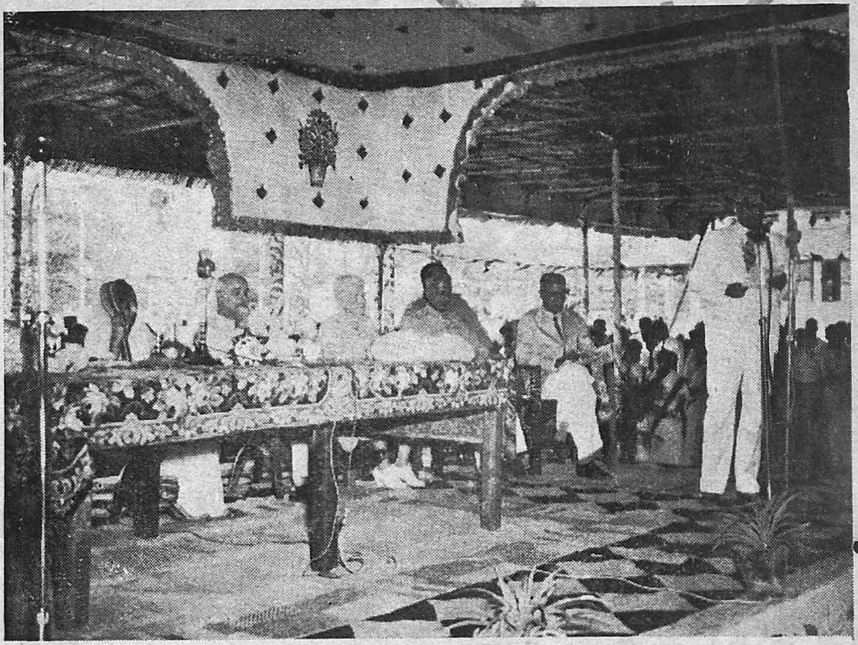
I am deeply concerned that while such attempts are being made to raise the standard of medical education in India, there appears to be a tendency in some quarters to establish medical colleges with no consideration for the maintenance of quality. I understand that a medical college has been established for which the promoters have set as their main consideration the creation of the institution and not the establishment of reasonable standards. I am told that admissions to the College have been sold up to 1962 at the rate of Rs. 3,000 per student and that the institution has started functioning with insufficient accommodation and with poor prospects of providing adequate clinical material for teaching purposes. The demand for medical education is so great in the country that parents and students may be willing to accept admission to any institution which holds out the possibility of granting a medical degree. But are these the criteria on which medical education is to be built up in India? Is any University justified in granting affiliation to such an institution? Are the existing powers aud procedures available to the Medical Council of India sufficient to deal with situations like this? These are all questions which require serious consideration. I am drawing attention to this particular medical college because I understand that organised propaganda is being set afoot in order to promote the creation of similar medical colleges. I shall certainly do my utmost to

prevent the development of conditions which are inimical to the growth of medical education on proper lines. India has gained a high place in matters pertaining to health in the South-East Asia Zone. I would not like her to lose it.

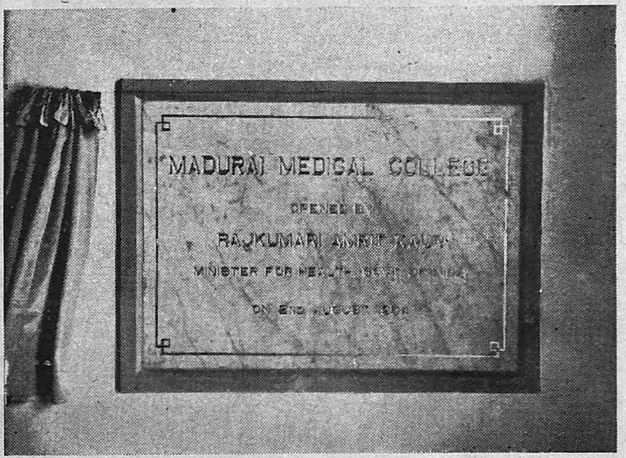
I have no doubt at all that the Madras Government will safeguard the maintenance of high standards. It is not lack of confidence in them which has prompted me to refer to these developments of a retrotrade nature. I felt, however, that I should use the present occasion to bound a note of warning that, unless both the Central and State Governments keep a close watch on what is happening in the field of medical education and are prepared to take appropriate action, conditions may be brought into being which will be extremely difficult to rectify at a later stage. The common interest of the people and of Government requires that the country should be led on the hard path of achieving progressively higher standards, even though the progress acclaimed may be slower, rather than on the easy road of a progressive decline in them. It is for us to act as our goal what is desirable for the promotion of the health and welfare of the country and to work towards the goal with all our strength and earnestness.

May I, in conclusion, congratulate the Government of Madras for promoting the establishment of another medical teaching centre and to express the fervent wish that the same may develop in due course into an institution which fulfils amply its function of creating and maintaining sound traditions of teaching scholarship and research. I trust the students who go out from its portals will be filled with the desire to serve the vast needs of this great land of ours and that in addition to a high academic standard this institution will also set a high standard of medical integrity, so sorely needed in the world to-day.

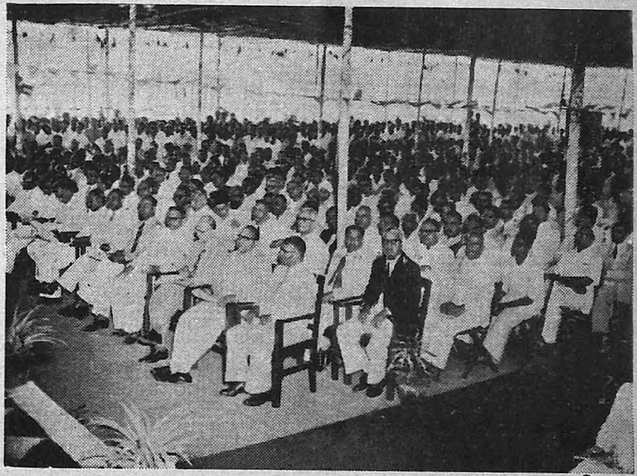
15 NOV 1956



Dr. C. Venkataramiah proposing the vote of thanks.



A view of the Plaque



A section of the vast gathering

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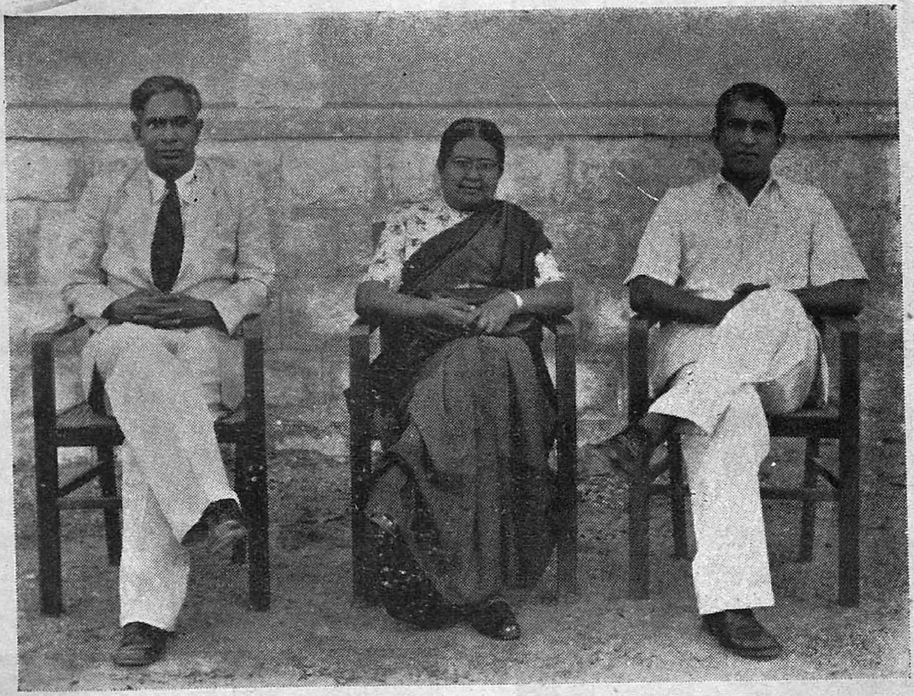

" THE THREE PROFESSORS "

Dr. (Smt.) Sarah J. Souri (centre), Professor of Anatomy, Dr. K. P. Anandan (left), Professor of Physiology, and Dr. A. N. Ramanathan (right), Professor of Biochemistry

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MODERN TRENDS IN ANATOMY

By

Dr. (Mrs.) Sarah J. Souri, M. B. B. S., PH. D., D. G. O.
Professor of Anatomy and Principal, Madurai Medical College.

We live to-day in an age of Science where distance is captivated by high-speeding jet planes, sound is transmitted and received through enormous distance of space, where the atomic energy stands over the brink while man decides whether its stupendous forces be harnessed for his own benefits or its devouring zests be directed to the destruction of his own race.

Knowledge has advanced through tremendous strides in all spheres of Science. In the post-Darwinian period-the era of Huxley - the anatomists confined their pursuits to the discovery of anatomical homologies and the missing link. In the present age, however, Anatomy permeates into vast scientific and medical fields and a great part of the medical curriculum. The Human Anatomist of to-day concerns himself with most aspects of biology and can appropriately be termed a Human Biologist. A few of the present Anatomists in America deal almost exclusively with bio-chemical problems.

In recent times there has been a distinct principle and objective adopted in Anatomy, that of keeping the eye over the living body. The dissection of the cadaver is a means to gain the knowledge of the Anatomy of the living subject. The knowledge of Anatomy in the living being has been made available through diverse methods and techniques.

The progressive science of Radiology has helped to visualise the several systems and viscera of the body in health and disease. Accurate concepts of structures and functioning of small parts of the body have thus been gained. Each living organism lives in four dimensions, three of space and one of time. The several cyclical intermittent and progressive changes have been observed through the aid of the X-Rays. Picture concepts of normal organs, the structure and functioning of living things have all been collected through repeated observations.

Modern visual aids have marked the commencement of a new era in the advancement of knowledge. "A little picture is worth a million words" says the Chinese proverb.

Lectures aided by specimens, pictures, models, slides and X-Ray plates projected on the screen give a new stimulus and impetus to modern teaching.

Variations and congenital malformations are fields which arrest the attention of the Anatomist and roots his interests in Developmental Anatomy. The histogenesis and growth of the tissues and organs, and the several co-ordinating mechanisms which are calculated to make a complete individual have been unfolded by devoted and ardent embryologists, zoologists and physiologists. Descriptions in embryology are chang-

ing constantly with new information offered by modern research.

A recent fascinating section of Human Anatomy is the follow up of the developmental and progressive growth of the individual through the postnatal years of life upto maturity.

Anatomy today aspires towards understanding of life and man. Such a knowledge entails knowledge of the origin of man with an insight into the theories of evolution. A subtle approach to the continuity of organic life its survival and propagation is along the field of genetics which attempts to indicate scientifically the inherent and countless possibilities of evolution, through mutation of the genes and natural selection.

The multi divergent problems of Anatomy are manifold and it challenges the students and specialists of this country to learn, to work, to labour, and to help solve the puzzles which still remain.

EDUCATION

Education is the best provision for old age — Aristotle.

Education begins a gentleman, conversation completes him — Epicharmus.

Education is the manifestation of the perfection already in man —
Swami Vivekananda.

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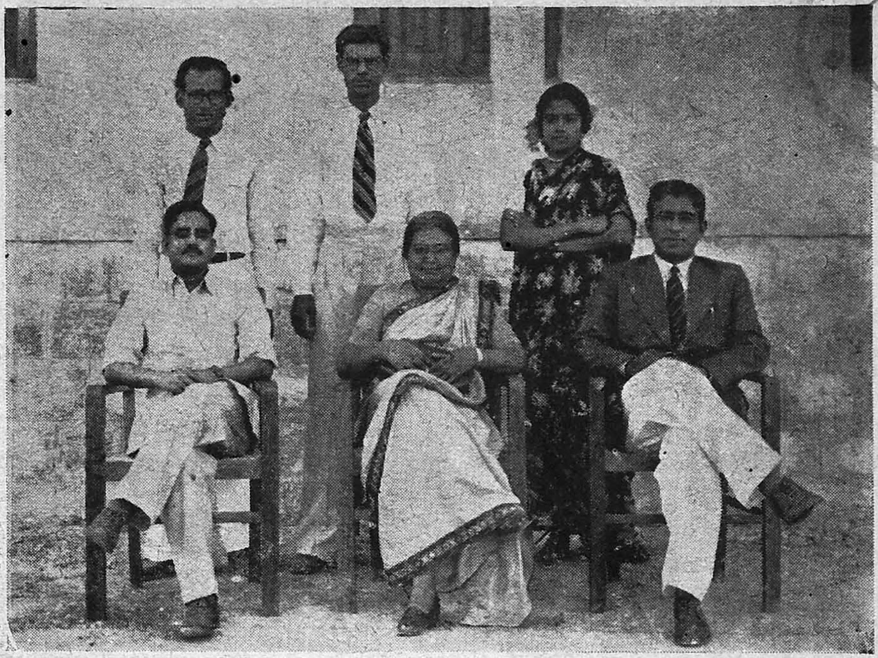
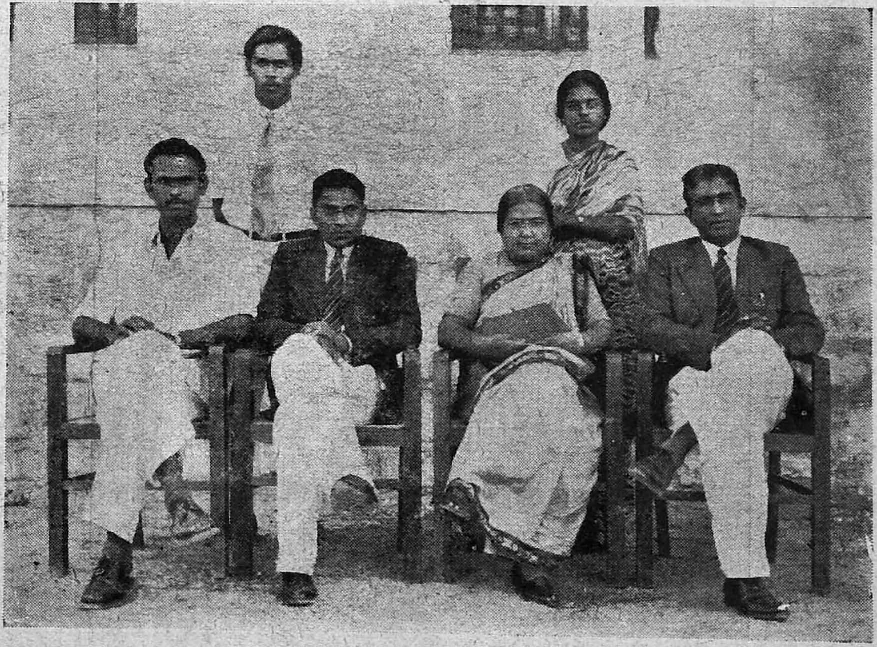


College General Committee 1954-55



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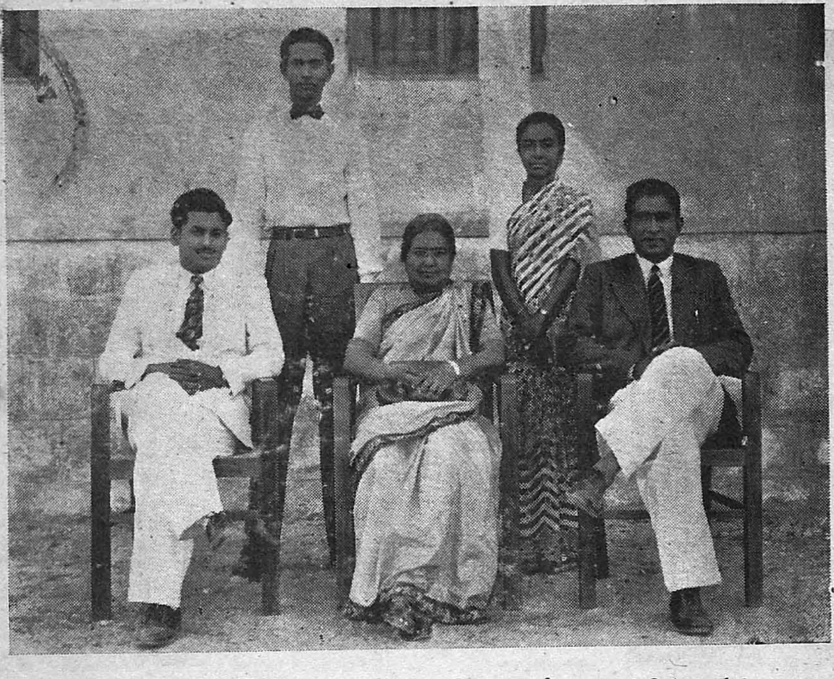
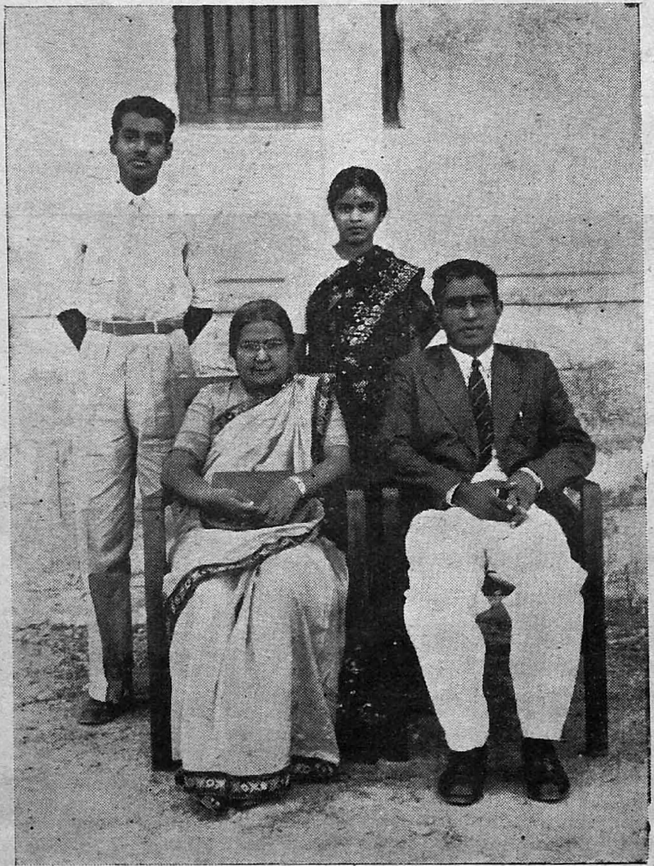


Social Service League Committee 1954–55



Fine Arts Association 1954–55

15 NOV 1958

THE RESURGENT SPIRIT

By

Dr. C. Venkataramiah, M. B. B. S., M. Sc., *Professor of Physiology, Andhra Medical College Visakhapatnam and formerly Professor of Physiology, Madurai Medical College, Madurai.*

(I thank the Secretary, the Madurai Medical College Magazine Committee, for the privilege extended to me in asking me to contribute an article for the Inaugural Number of the Magazine. I can never forget my association with the Madurai Medical College in its inception though my work in the college lasted little beyond six months. And so what little I write I do with those feelings of attachment to the students and staff members of this baby institution, which, from the mere passing remembrance are roused to a crescendo, the ripples smoothening out as when a pebble is thrown into still waters, leaving me to my environment once again—C. V.)

Life is endless. Generations have gone in the past handing over traditions in every sphere - traditions of culture, civilisation, behaviour and activity-and generations go on *ad infinitum.* We constitute the passing phase. The whole thing appears to be a Great Experiment, more particularly in regard to the highest species - *Homo Sapiens.* What the results of the experiment are likely to be a thousand or a million years hence, no one can predict. But one thing appears to be fairly certain from the evolutional aspect, viz, that a peculiar reaction of man or woman by the impact of environmental stresses of the time plays the determining factor - a secondary force that runs through all the etherial minds, not the mere physical brains, summating the crests and the troughs in the reverberent waves of action and reaction in the individual and community life, in the national and international spheres. Basic natural forces, thus crested and troughed or irregularly notched or aberrated, influence the etherial mind of the next generation or generations probably at their very inception, paving the ontogenic evolution of thought, attitude, behaviour and intellect. Thus it may be, that we find the younger generation today to be more reactive, more observant and more critical in certain respects than us in our younger days. It is a resurgent spirit that dominates the life of this young generation, perhaps evolving better adaptation to changing social, economic and political conditions, perhaps tending to produce better harmony in human relationships, be they communal, racial or international. The older generation is in its decadence and it has foamed up a fear psychosis partly imbibed from the past and partly of its own creation making tools of scientists in the manufacture of biophagic weapons that engulf mother earth and tend to make it a lifeless, arid body among the planets. The amassing of such weapons alone constitutes a potential danger and any panicky release or any mistake or accident, man made or otherwise, may bring on according to those in appraisal, a global catastrophe over which the scientists have no control.

Where the older generation are failing to build up human concord as we witness today, the resurgent younger generation may yet succeed.

We need not solely feel proud that our own sons and daughters appear to be more gifted than ourselves, thus casting a reflection on hereditary endowments, as the diverse factors that influence the genes are never fully known. It is a biological force-this resurgent spirit-that determines the characteristics of the entire younger generation. They may or may not be more intelligent than ourselves, for intelligence alone is no criterion, As we find them they are certainly more active, reactive and adaptative than ourselves. A challenge and a heavy responsibility awaits them throughout the globe.

We in our younger days were habituated to focus our energies in studying the subjects taught at school or college. We are inclined to force the younger generation to do likewise. But now-a-daysthere is a mild rebellion of youngsters over the question of studiousness which is replaced by new and increasing tendencies - more associative, more free-lance like, more inclined to extra-curricular hobbies and more attempting to gather and exchange ideas on national and international platforms, compared to our own which were there but more limited. The writer shall not be mistaken that these increasing tendencies constitute according to him a resurgence. On the contrary they are a sign of resurgence and nothing more. The new buoyant spirit is trying of its own accord to create several venues to satisfy its own craving and it hates bullying. Scholasticism is for the younger generation an unavoidable means for livelihood that should be gone through with minimal effort and perhaps they are unconsciously erring on the right when viewed against the present background of human travail. It is the exuberant manifestation - more unknowingly than knowingly-of a revolting spirit against the old bent of mind and against fixed phobias and with a latent urge in search of. a common basis for human fellowship and happy living. While the elders who follow current trends in world affairs tremble at the shape of things in near future, the youngsters who also follow in their own way just laugh - be gone if the worst comes! Why worry? The mad humanity will come to an end!

" Will the worst happen? Is it very likely in the near future?" are the posers now. The big nations that are racing in the invention of atomic weapons are just doing it. They bank on the necessity of weapon supremacy and on the necessity of meeting 'threat' with 'greater threat'. As nuclear knowledge is advancing, nuclear scientists have become the tools - perhaps they like it - of experiments in *homo* - destruction, an ironical culmination of the relentless unravelling of nature's secrets and their tragic implementation that betokens the revenge of nature, when human ingenuity could equally harness the researches for a beneficial implementation! Humanity perching on the brink of heaven and abyss!

But while the resurgent spirit of the younger generation is letting itself out in various pursuits profitable or wasteful, it requires immediate recognition and proper canalisation. It behoves every nation to develop new trends in education, in part at least, based on elements of social and political psychology, expanding the mistaken notions of the older generation and of the extinct generations that wars

constitute a necessary evil in human existence and that wars are likely to confer peace. It requires a new orientation of thought and outlook gained by experience and a ruthless negation of the erstwhile guiding principles based on mutual distrust and fear, rivalry, racial superiority, coersion into political doctrines, and the ludicrosity of benevolent domination. The new education should impart the principles of peaceful co-existence propounded by one of the greatest statesmen of the world today and for all-time, Sri. Jawaharlal Nehru, and the younger generation will indeed grab at them and thirst for their understanding and in seeking ways and means of their implementation.

It is too hard, perhaps foolish, to think that man, with all the ingenuity conferred upon him by Mother Divine, is capable of forcing a global tragedy, a destiny of oblivion, by a stroke of insanity. The resurgent spirit shall dominate the picture, sooner than later, before the critical hour approaches, and shall relieve itself and of humanity at large of the present psychosis down from the depths of the emotional mind and save the world from a cataclysm. Yes, the older generation that will ere long vanish into thin air shall still find for itself with ethereal eyes, a new vision of a happy world family - *homo sapiens.* The seeds of a new awakening, of tolerance and peaceful co-existence and the contentment of human fellowship shall take deeper and deeper root and sprout and blossom with succeeding generations, leaving the past travail for the records ! Life is endless and sweet.

JAI HIND !

PATIENT : " Doctor, I have been suffering like this for a long time. I consulted a chemist."

DOCTOR : " You consulted a chemist ? You surely know chemists always give the wrong advice. Pray God ! What did he say?"

PATIENT : " He asked me to go to you, Doctor ".

WILLIAM HENRY PERKIN

(1860—1929)

By

Mr. R. Subramaniam, M. A.

Former Asst. Lecturer, of Organic Chemistry Madurai Medical College.

The life and work of William Henry Perkin, one of the great masters of Organic Chemistry is as inspiring as it is instructive to the young students of the subject. The remarkably brilliant career of this illustrious chemist strikingly demonstrates that the development of the individual can be profoundly influenced by both heredity and environment, however fiercely the relative importance of these two factors may be argued. None can doubt that his synthetic genius was inherited from his unusually gifted father Sir William Perkin (who had to his crdit the synthesis of the dye Tyrian purple or mauve at the age of eighteen),or that its practical application owed much to the circumstance that there was a laboratory attached to the house where Sir William worked on problems that interested him.He was brought up in an atmosphere of research and thus acquired almost instinctively the feeling that the great object of his life must be chemical research. Perkin lived in those highly productive years of Organic Chemistry, generally known as the golden age, and had the privilege of being a student of Adolf von Baeyer in the company of a galaxy of brilliant men like Otto Fischer, Konigs, Frildlander, Bamberger, Curtius, von Pechmann and others.

Perkin, born on June 17th 1860, was the elder of the two sons of Sir William by his first wife. He studied in the City of London School which was the only one where science was taught at that time. Leaving the school in 1877, he entered the Royal College of Chemistry at South Kensington. He was later sent to Germany for further studies in chemistry. After putting in two years of study at Wurzburg under Wislicenus he took his Ph. D. degree in 1882. He then proceeded to Munich to work under Baeyer and thus enterered the best period of his training. Shortly after his return from Munich, he was selected as the first Professor of Chemistry at the Heriot - Watt College, at Edinburgh. In 1892, on the demise of Carl Schorlemmer, he was called to the Chair of Chemistry at Owens College, Manchester and he filled this post with distinction for a period of twentyone years. In 1912, he accepted an invitation from Oxford to occupy the vacant Waynflete Professorship of Chemistry. Here he continued until his unexpected death took him away on September 17th 1929. Such, in the barest outline was Perkin's career.

Perkin was the recipient of many honours; the Longstaff Medal of the Chemical Society (1900), the Davy Medal (1904), and the Royal Medal (1925) of the Royal Society. Of the many degrees conferred on him may be mentioned Hon. M. Sc. Victoria; Hon. Sc. D. Cambridge (1910); Hon. LL. D. Edinburgh (1910) and Hon. LL. D. St. Andrews (1911). He was a corresponding member of the Bavarian Academy of Science and of the Academy of Gottingen, correspondent of the Academy of Science (Institute of France), honorary member

of the Royal Society of Edinburgh, of the American Academy of Arts and Sciences, of the Belgian Academy of Medicine, and of the Royal Society of Upsala. He served on the council of the Royal Society during 1904–5 and 1908–10. He was a Vice President of the Chemical Society (1906-09, 1915–23 1924-27, 1929) and was its President during 1913–1915.

Perkin's interest in, and aptitude for Chemistry was in evidence even while he was very young. At the City of London School he was not regarded as a very distinguished pupil in ordinary form work, but he took most of the science prizes. In the latter part of Perkin's time at the school he concentrated on mathematics dropping Greek and Latin; this was perhaps the reason for his failing to pass the Matriculation Examination of the London University. While not at school, he worked in his father's laboratory and thus had excellent training in practical work. When therefore, he entered the Royal College of Chemistry at South Kensington in October 1877, he was at once recognised as a student who stood out from all others, and in the opinion of his professors was certain to make his mark in chemistry. He had read extensively, had very clear ideas of what he had read, and in practical work had the grip of an older student. He went through the routine course in record time and after some practice at organic preparations, he was allowed to start research work under the direction of Dr. Hodgkinson. His work is recorded in two joint papers with Hodgkinson: "On the action of sodium on phenylic acetate" and "on the action of benzylic chloride on phenylic acetate". Dr. Hodgkinson who had opportunities of seeing both father and son at work, thought even at that time, that the son was quicker in manipulation. During vacations Perkin did a good deal of work in his father's laboratory.

When Perkin had been at the College for two years, it was suggested that he should go to Germany to continue his scientific studies. Sir William was averse to this idea at first, for fear of the religious views of his son being undermined at Germany which he regarded as a dangerous centre of free thought. But Dr. Hodgkinson finally succeeded in persuading him to let his son go, and in October 1880 Perkin went to Wurzburg to study chemistry under Johannes Wislicenus. In 1882 he took his Ph. D. degree, presenting as his thesis the work he had done on certain condensation products of oenanthaldehyde.

In August 1882, Perkin went to Munich to work under Adolf von Baeyer, and entered on what was probably the pleasantest time of his training. The laboratories at Munich were so well designed in all their details, that they long served as a model for the other laboratories which gradually sprang up in all the principal university towns of Germany. Promising young men from all parts of the world flocked to Munich to study under Baeyer. An excellent description of the atmosphere into which he entered Munich is given by Perkin himself in the Baeyer Memorial Lecture which he delivered in May 192 . It was not often that Baeyer suggested subjects for the researches that the younger men were carrying out for dissertations for the Ph. D. degree; when fit for original work, they were generally handed over to one or

other of the many Privatdozenten attached to the laboratory, and it was the duty of these seniors, who were often men of great experience, to suggest the theme for investigations, to superintend the work, and to help to bring it to a satisfactory conclusion. The plan worked very well, and gradually there arose a great school of research which has rarely if ever been equalled. It used to be said that at one time every Professor of Organic Chemistry of any eminence in Germany was a pupil of Baeyer's. It was however the example which Baeyer himself set which was the great driving force and the mainspring of the great reputation that the Munich school enjoyed. The Position of each worker and the esteem he enjoyed depended solely on the quality of his work. This was the atmosphere which produced great chemists and weeded out those who were of no account. In Baeyer Perkin found his ideal of what a professor and research worker ought to be; much of what he said in the Baeyer Memorial Lecture in describing Baeyer's teaching and experimenting might well be used to decribe Perkin himself. This similarity has even led to the suggestion that in his attitude to chemistry Perkin had moulded himself on Baeyer.

Perkin's outstanding abilities in experimental work soon made him persona grata among the elite in the laboratory. He was appointed Privatdozent after having presented a thesis on his work on ethyl benzoylacetate. Ethyl acetoacetate was at that time attracting a great deal of attention, and much interest was therefore attached to the isolation of the corresponding phenyl derivative. Another subject on which he commenced work and carried through a large number of researches was on the formation of carbon rings. That rings containing less than six atoms of carbon might exist had early suggested itself to Perkin, and he felt very strongly tempted to try to effect the synthesis of such rings. This view was entirely opposed to the idea held at that time, that carbon rings containing three, four or five atoms of carbon were not capable of existence, and the older chemists to whom Perkin submitted his proposal were far from encouraging. In the first Pedler Lecture, delivered in May 1929, Perkin stated that Baeyer as well as Emil Fischer and Victor Mayer rated as very slight the prospect of synthesising small carbon rings. But it was with brilliant success that he entered on his work, and during his Munich period, a series of papers describing numerous derivatives of compounds containing rings composed of three, four and five atoms of carbon, were published. This work which is of fundamental importance, is itself sufficient to show Perkin's genius as an Organic chemist. His wonderful powers of devising methods for overcoming difficulties and of adapting the means at hand to attain the end desired, were vividly evident at this early period of his career. Indeed the work Perkin did on the structue of hexamethylene ring showed clearly for the first time the intimate connexion between benzene and cyclohexane and established beyond doubt the structure of the reduction products of the aromatic nucleus. When he left Munich in 1886 his position as one of the most promising of the younger chemists had become firmly established. Many years later, Baeyer seems to have remarked that of the many distinguished pupils he had, two of the greatest ability were Emil Fischer and W. H. Perkin.

On Perkin's return from Munich, he was offered a place in the laboratory of Professor H. B. Dixon at Owens College Manchester. It was at this time that he started work on brazilin and haematoxylin. About the middle of this Manchester period, F. S. Kipping, who was also at Munich at Perkin's time returned to Manchester, where his people lived and this had an important influence on Perkin's life, for it was at Kipping's house that he met the lady (whom he afterwards married) who was staying at Manchester with her younger sister to whom Kipping was engaged. Perkin became more intimate with Kipping, and as all students of Organic Chemistry know, they were associated in writing a text-book of Organic Chemistry (published in 1894) which was for a long time a standard for teaching of Organic Chemistry in Colleges.

In 1887, Perkinwas selected from several candidates, as the first Professor of Chemistry at the Heriot-Watt College at Edinburgh. Although the routine teaching work took most of his time, a good deal of research work was turned out during this period. The investigation on the synthesis of ring compounds was continued and extended; there were researches on acetylcarbinol and analogous compounds, and a large amount of work onC amphor and Camphoric acid (not published until later). The outstanding feature of the Edinburgh period was the initiation of the investigation of the alkaloids berberine and cryptophine. Perkin's brilliant researches led in 1890 to his being elected a Fellow of the Royal Society at the early age of thirty.

When on July 27th 1892, Carl Schorlemmer, Professor of Organic Chemistry in the Owens College, Manchester died, Perkin was invited to fill the chair of Organic Chemistry The small space available for Organic Chemistry was soon over-crowded, even the rooms built for research work having to be given up for the general instruction of students. On the death of Schorlemmer a fund had been raised by his old students and it was decided that the best memorial would be the erection of an Organic Chemistry Laboratory to be called after his name. The constructions was completed soon and with this it was possible for Perkin to build up a great school of researeh. The large Schorlemmer laboratory was filled with students, and its reputation as a school of research obtained world-wide recognition In 1904, three more laboratories were constructed to meet the needs of an ever increasing number of students. With the additional buildings and equipment, a great drive was given to research work and investigations were carried out in this period on camphor, the terpenes, brazilin and haematoxylin, carbon ring compounds and bridged rings, the alkaloids and many other subjects. Such was the reputation of the Manchester School of Organic Chemistry that Emil Fischer once declarad that it rivalled his own school at Berlin.

While at Manchester, tempting offers of Professorships elsewhere were made to Perkin but he had rejected all of them. In 1912 however, he was informed of a general desire among scientific men at Oxford that he should occupy the vacant Waynflete Professorship of Chemistry. Perkin accepted the invitation and in doing so was probably attracted by what he expected to be the calibre and

possibilities of the students he would find at Oxford. His connection with the Manchester University terminated in July 1913, he then having held the Professorship of Organic Chemistry for twentyone years. His successor to the Chair was his brother-in-law, Arthur Lapworth who had married the younger sister to Mrs. Perkin and Mrs. Kipping.

At Oxford, Perkin was the only Professor of Chemistry, and the laboratory was the old Chemistry department. This had to be expanded and modified for purposes of advanced teaching and research work. With the help of contributions made by Mr. Charles William Dyson Perrins, new buildings came up and money was also found for equipment. The new laboratory known as the Dyson Perrins laboratory, is stated to be one of the best, and not inaptly termed a "palace of chemistry". The arrival of Perkin had a great and immediate effect on original research work at Oxford. He completely transformed the chemistry school; a great flood of chemical research started from Oxford, which had fallen behind other Universities. The war involved Perkin and his department in the investigation of many problems arising out of the abnormal conditions. Besides, the shortage of dyes in England in the early war years led to the establishment by the British Dyes Ltd., of small colonies of chemists at various universities. Such a colony of five to seven men was started under Perkin at Oxford in 1916. Under his supervision, considerable amount of original work was carried out till 1925 when the colony was finally closed down.

In 1913-15 Perkin was President of Chemical Society. He chose for the subject of his first presidential address "Tautomerism" and for the second "The position of Organic Chemical Industry". Almost the last appearance of Perkin at the Chemical society was on March 30th 1929 when he delivered the first Pedler Lecture "The Early History of the synthesis of. Closed Carbon Rings." In the early summer of 1929, Perkin was not well and his indisposition became more serious as the summer went on. For months previously he had been working on Strychnine and he and his doctor felt that he was in some way affected by the alkaloid. It was thought that a visit to Switzerland might be beneficial, but instead he got an attack of pleurisy which seriously affected his heart. He was brought back to Oxford and for some time seemed to be going on well; then came a rapid collapse and he died on the 17th of Sept 1929.

Apart from Chemistry, another of Perkin's interests which started early in his life was music. This was helped, if not induced by his environment, for the Perkins as a family were very musical. At Munich in his free hours he threw himself with energy into the life outside the laboratory and music was an important item. At Manchester too, which is said to be the most music-loving town in England, Perkin found great scope for his musical proclivities. He played cricket and retained his keen interest in the game throughout his life. At Manchester he used to be called "W. G." because of his beard. He also played a vigorous game of tennis, and was good at billiards of which he was very fond.

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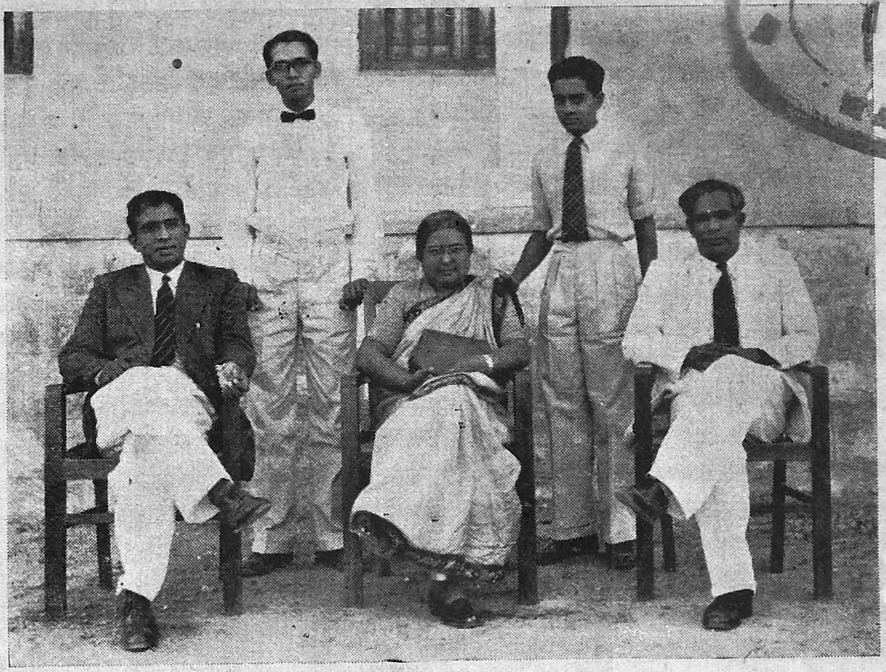

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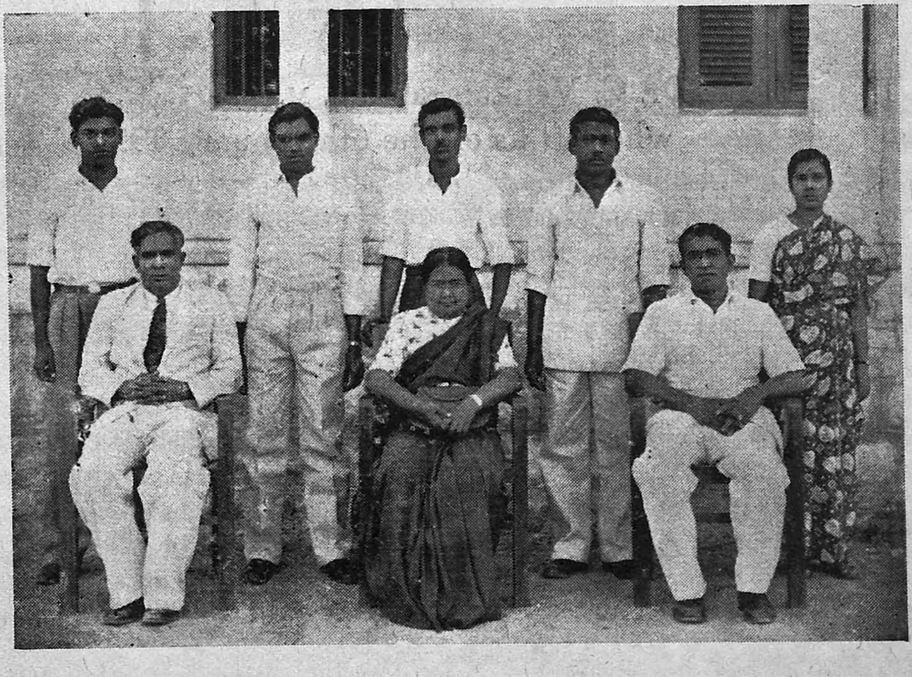

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Dr. C. Venkataramiah, M. B., B. S., M. Sc.
who left us on the 6th January 1955.

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DR. C. VENKATARAMIAH, M. B. B. S., M. Sc.,

An Appreciation

. Yes, the 6th January, 1955 was a sad day for the staff and students of the Madurai Medical College, Madurai, for on that day Dr. Venketaramiah, the then Professor of Physiology left us on transfer to Vishakapatnam, at a time when his forceful personality, wisdom and guidance were sorely needed. In fact his commanding personality, incomparable capacity and his disconcerting unconventionality endeared him to all of us.

It would be indeed a very difficult task to list his contributions to the Madurai Medical College in its early stages. Suffice it to say that he was the one man to whom we owe the publication of the Souvereir in time for the inanguration, an accomplishment which we consider something of a miracle.

Secondly, when the students of the hostel were suffering under the system of catering by a hotel contractor when they were on the verge of developing deficiency syndromes Dr. Venkataramiah thought it was time to say "HALT". Almost by overnight he organised the mess to be run on a co-operation basis under his able wardenship. No man other than Dr. Venkataramiah could have attempted this. The students of the hostel are forever grateful to him for this life-saving measure. Generations of students will remember him for his farsighted venture against terrific odds.

Thirdly Dr. Venkataramiah as the Vice President of the Magazine Association was determined to bring out the inaugural number during the year of the inauguration of the College. This inaugural number certainly owes its existence to him.

It is difficult to say whether we loved him more as Professor of Physiology, as the warden of the hostel or as the Vice-President of the Magazine Association. The fact is we loved him and he loved us.

It is our pleasant duty to wish him, wherever he may be, long life and prosperity and we, the first batch of students, will always remember him, and his forthright methods.

Heavy-Weight Boxer :- "The trouble is doc, that I can't get sleep.

Doctor :- "Try anto-suggestion. Lie on your back and count uptil ten."

DOWRY IN 2055 ?

By *Frank*

Two ultra modern fathers, discuss the age-old question.

Girl's Father: Take some pan.

Boy's Father: Oh! Thank you. Thank you. This is a necessity for serious conversation.

G. F. How is your son ? By the way about the mar......

B. F. You mean the dowry. Now, the market rate for a boy of my son's capacity is Rs. 5,000,000 plus a helicopter.

G. F. 5 million! But that's preposterous. Anyway may I know what your son does to eke out a living wage.

B. F. He treats people.

G. F. What do you mean by 'treats people' ?

B. F. He treats people, that's what I mean and that should quench your inquisitiveness. One thing more I'll tell you, the people like him.

G. F. Cheap glory eh ? But anyway how do you know they like him.

B. F. They crowd by the hundreds, at his doorway.

G. F. Now coming to business how about making the sum Rs. 5 for tradition's sake and instead of a car. I'll give him a...... a...... What do they call it ?

B. F. You mean one of those Delta-winged Vampires.

G. F. Don't be silly. I mean a..........

B. F. A turbo-propelled jet.

G. F. Sir, don't be absurd. I mean a...

B. F. One of those new contraptions. A car cum boat cum plane.

G. F. You have gone crazy. What I meant was a cycle rickshaw.

B. F. (Shouts) Smelling Salts, Smelling Salts.

G. F. You can smell anything even pepper but that's my last offer. And you never considered my daughter's qualification.

B. F. S.S.L.C. (rec.) ?

G. F. Don't be so sarcastic. Ask all the workmen on the railway line and they will tell you about her executive powers.

B. F. My God! Help my son.

G. F. Sir, my daughter is an executive engineer.

B. F. An engineer! What luck! My son is a plastic surgeon. Why didn't you tell me that before and there would not have been this long argument. A doctor and lady engineer and the children will be anti-atom scientists.

G. F. What ? Anti-Atom ?

B. F. That's the latest defence against atom and Hydrogen bombs. They call it 'antiatogen'.

Note : The boy and girl were happily married. Even the marri age expenses were shared fifty-fifty.

WAR

By
E. Gunaseelan, B. Sc.

We are all familiar with the wars that were fought with guns, tanks, torpedoes, guided missiles and other forms of destructive weapons during the past two great world wars. People died like flies. The atrocities of those wars have almost come to an end after a period of reconstruction and scientific advancement. Yet there is another type of war that is being fought in every-day life, in every aspect of nature, in every kingdom of life-a war which is unending and so widespread that much of its significance escapes our notice. That is the war which is meant for the 'survival of the fittest' - a device adopted by nature as if for her own childsplay.

In this struggle for existence man - Homo sapiens - has played an important part. With the walk of time certain races of our species have been exterminated and some are on the road to extermination. But it is not man always who wins the battle, for certain species of animals are endangering the existence of our race. For example in a certain part of Africa the domination of a fly the Tsetsefly has driven inhabitation out of all possibilities. Even plant domination threatens our existence by making vast areas of land uninhabitable.

This struggle for existence may be said to arise from three requirements, the first and foremost of which is the problem of food, secondly the problem of self-defence against enemies and lastly the problen of continuance of species and their propagation.

To accomplish these necessities nature has provided every possible amenity to animals and plants. These weapons of offence, defence and maintenance are termed adaptations. To illustrate this phenomenon a few examples of special interest may be given.

Drosera is an insectivorous plant possessed of glandular cells which secretes a sticky substance capable of shining in sunlight. The innocent bees and small beetles are attracted by this and once they alight on the leaves they cannot escape. They are slowly absorbed by the plant. This is a deceptive mechanism by which the plant obtains its nitrogenous food supply.

A well-known example of trap mechanism is exhibited by Nepenthes or the Pitcher plant whose leaves are so modified as to form a sac-like structure with a lid and some sensory hairlike structures within the walls of the sac. The rain water collects in the sac in which the insects are drowned being unable to find an exit.

It is interesting to note that desert plants store up water when available to survive the impending hot summer. Mechanisms are present in them which allow of minimum evaporation from the leaf surfaces Desert plants have a very thick cuticle for this purpose. It is worthwhile observing trees in swampy areas which have similar water storing capacity since they suffer from a "physiological drought" i. e. they cannot make use of the available brackish water.

Rodents are singularly peculiar. If one of the incissors in the lower jaw is broken the corresponding tooth in the upper jaw grows unchecked, takes a curved course and eventually pierces the cranium damaging the brain and killing the animal.

Rabits, it is said, if starved will die more because of unchecked growth of teeth than of starvation Anteaters of Central America have still more interesting modes of nutrition. The animal has a long snout tapering towards the end. The mouth is slit-like and toothless which lodges a tongue of about 18″ in length used in picking up ants on the surface of the ground and from the ant colonies.

The beaks of birds are limit less in their variations and adaptations all of which enhance the feeding habit of the individuals.

The boa, a giant type of snake has a well developed muscular body by which it squeezes mercilessly any animal or bird upon which they feed. Even bones are crushed to pieces facilitating the animal to devour even victims of much larger size wholesale. The venomous snakes are, no wonder, dreadful to all animals because they subdue their prey with their poison fangs.

Marine animals are none the less adapted for effective feeding. The electric-ray fish is endowed with batteries of cells capable of emitting electrical shocks of sufficient strenght to paralyse the prey in the vicinity. This powerful mechanism is so perfect that even human beings are sometimes in trouble. The feeding methods of animals and plants are such a fascinating study.

Certain feeding mechanisms effect also self-defence. We would not have missed the sight of a cat using its teeth when cornered by a dog to defend itself. The electric-ray fish uses its weapon to drive away stronger animals miles away.

Skunks are remarkably adapted for self-defence. These animals are able to discharge a foul smelling fluid in the form of a spray to a distance of about 10 feet which keeps any unwanted intruder far away because the odour of the spray is abominable and intolerable. It can cause even itching over the skin. Hence the word skunk is used to express a person's dislike for another. The Bombordier beetle is yet another example of such effective defence mechanism which helps to ward off intruders.

The porcupine cannot be easily fooled because the barbed arrows they send on their enemies create a serious problem. The ink sacs of the cuttle-fish are remarkable in their efficiency in camouflaging the vision of the opponents by ejecting a black ink in water, the animal then retracting and thus escaping from their enemies.

Certain defenceless insects closely resemble insects of other species that are feared by their neighbours. Bees are four-winged insects that have an effective stink. They are hairy and show contrasting colours. Bee-flies have only two wings and they have no stink. But since they too are hairy and are coloured like the bees they may be easily mistaken for these formidable insects and it is possible that potential enemies fly for this reason.

Some animals feign death in order to try to escape from their foes. The

hog - nosed snake of North America feigns death on occasions; when confronted with an enemy it will turn over on its belly. When the enemy is away it will assume its former position as if this were the only proper pose for a dead snake.

For the continuance and propagation of a race, food and protection alone will not suffice. The well-being of offsprings is also an essential requirement. The seahorses protect their eggs in a pouch carried by the male meant exclusively for the purpose The eggs remain a part and parcel of the male until they are hatched out. The Kangaroos, as we know, guard their offspring in the marsupial pouch possessed by the female. The young one remains inside the pouch waiting for the time when it can go about independantly.

In the vegetable kingdom also adaptations for propagation and effective nursing of seedlings are met with. The cocoanut is capable of voyaging by oceans to reach a different region of the globe to be widely dispersed. There are deceptive fruits and seeds which through the agency of birds and animals work a long way in the propagation of the species of the plant kingdom.

From what has been said so far it will be followed that those animals and plants which are capable of adapting themselves to the conditions existing as well as changing on earth alone can survive and the rest are bound to be exterminated. This fact has had a great bearing on the evolution of life from a single cellular organism to the civilised intelligent human of to-day. Accordingly we are not led to think that this process has come to a stand-still. It may be asked then, what would be the like of the species superseding the present generation. The answer is perhaps screened by the broad vistas which atomic science has opened to us.

A negro, who had bashed his head entered a doctor's clinic.

"Sah! I done got my head carved up with a razor, doc." said the darkie.

"Why don't you keep out of bad company?" asked the doctor.

"I'd sure like to, doc, but I ain't got the money for a divorce."

THE ACHIEVEMENT OF EVERLASTING PEACE.

By

M. Y. Sankaran

The achievement of everlasting peace is not only a hope, but a firm conviction of every sincere, pious and good natured man and woman. But it may look both impractical and fantastic, but any problem of this kind requires deep thought, great planning and religious fervour for its realization.

We are to-day on the threshold of a new era. After many attempts at utter devastation as witnessed by the two world wars, we have settled down to think over the past and mould our future. The soul of man yearns for peace, the kingdom of God must only have peace and mankind thrives best only during peace. Never before in the history of the world have we witnessed such dire craving for peace as it is to-day.

The opponents of this idea of everlasting peace are those who look at it from different angles. Human nature being what it is, quarrels are inevitable. Hitches between states and countries are bound to occur so long as envy, jealousy and rancour take possession of the minds of men. The high state of military advancement and methods of warfare, have certainly added to man's thirst for blood, loot and power. Any trivial cause is enough to ignite the latent power for destruction and wars can be hatched under the slightest pretext.

The second point raised by the opponents is that wars are sought because they give quick results and the idea of warfare and its efficacy has taken a deep root in certain states The advantages of war outweigh the fruits of a distant, and so the concept of everlasting peace does not catch the ready imagination of those in whom power and strength are concentrated.

The third point raised by the opponents of this idea is that it is only a pious experiment. Experiments are good, but the material to be experimented upon is the vast mankind and the vast universe is the laboratory. No great and lasting results may be seen in this plane and experiments of this kind have never brought us good results. It is only a fascinating thought to be reflected upon when we sit near the fireplace on a cold night. It deserves no more serious attention.

However the fallacy of the opponents of this idea of everlasting peace must be exposed sooner than later. There may be wars, but war is only a temporary phase leading to peace and our effort should to be strive for the more lasting and permanent peace, that is going to really bring the kingdom of God down to the earth, so that man may really love his fellowman and make this earth a heaven for all mankind, irrespective of race, colour or creed.

Secondly, wars are sought because of a false idea that the fruits of war are quick and decisive. Never before have we witnessed in history the efficacy of war to better a cause or to usher in a new era of peace. The world to-day is tired of

war, the misery of warring nations and the vast devastations of human life. and property. Really speaking, wars are resorted to in despair in a state of anger, confusion, hatred and suspicion and the authors of war are not the true representatives of the countries they proclaim to represent. The two world wars are proof enough for this argument and the everlasting peace is the ideal of any nation or individual and anything else is only a political shibboleth and a craze of few political opportunists.

In few words war is never a solution for peace and it only side-tracks the mind of man to the gospel of satan. The greatest of experiments have been made in this world only by the greatest of men. No doubt, this universe was their laboratory. We witnessed Mahatma Gandhiji's experiment on peace. Which has led the way of this country and the rest of this world? Is it his gospel or the mad ravings of Hitler and Mussolini? The fact that people are talking more now than ever of everlasitng peace is itself a tribute to this vast experiment.

It will succeed and bring in an era of peace and plenty for the down-trodden countries and elevate the mind of man to its full stature.

Doctor (looking at Sandy's blood shot eyes): "What do you drink?"

Sandy (brightening): Oh! Usually gin, but I'm not particular. I sure don't mind anything you got doc.

ATOMS FOR PEACEFUL PURPOSES

By

S. Ramakrishnan, M. A.

Assistant Lecturer in Organic Chemistry, Madurai Medical College.

The application of the atoms and atomic energy for peaceful and constructive purposes and its cardinal and paramount importance are increasingly engaging the attention of not only the scientists but also the world statesmen as clearly evidenced in the animated discussions in the United Nations General Assembly recently. Subsequently, the spontaneous offer of 100 kilograms of fissionable material by the United States Government to power-starved countries has spotlighted the honesty and sincerity of purpose of President Eisenhover in sponsoring the "Atoms for peace" plan to set up an international Atomic Bank by an international pool of atomic resources. Thus the burning topic of the day is 'Atoms for peaceful purposes'.

The word 'Atom' is a very common, very familiar, but to many, a terrifying word. When they hear about Atoms and Atomic energy, they immediately picture before them the two huge cities Hiroshima and Nagasaki being engulfed in balls of fire with tongues of flame and enmeshed in heat waves. To them Atomic energy is a colossal and a gigantic power capable of complete destruction, mass extermination and even total annihilation. They seem to think that Atomic energy is intended only for a dreadful global conflagration. That is why, they don't hesitate to jump to the conclusiou that 'Science in general and atoms in particular are calculated and conducive only to destruction and not to construction or constructive perfection.

But time and again it has been reiterated that Science is neutral and that it deserves commendation and not condemnation. In fact Science helps to establish a bond of friendship and brotherhood between people of various countries. That is because Science grows by mutual contacts and a common enterprise. Scientists also are humane, sympathetic and peace-loving. No less a personality than Dr. Oppenheimer who was responsible to a great extent for making the Atom Bomb a solid actuality, has cried halt to the alarming stock piling of the Atomic weapons which are notorious for their inflexibility and cataclysmic consequences. Another famous scientist De Broglie has expressed grave concern regarding the continuation of Hydrogen bomb explosion experiments in the Pacific by the Americans. The very dust, the radio active dust or the death-dust as it is called, contaminating the atmosphere as a result of these experimental explosion was fatal to those unfortunate fishermen rowing in the boat 'Fortunate Dragon'. If this be the case even with experimental explosions, one can well imagine the immeasurable and incalculable havoc to the world when these weapons form the gruesome additions to the arsenal of war.

Thanks to some politicians at the helms of affairs, they are for Atoms for construction. Our beloved Pandit Nehru, the architect of peace front is persistently and consistently insisting on the complete ban of the so called A B C weapons (Atomic, Bacteriological and Chemical weapons). Churchill

has hit the nail on the head when he observes that "the revelation of the secrets of nature hitherto mercifully withheld from man should arouse the most solemn reflections in in the mind and consciousness of every human being capable of comprehension; we must indeed pray that these awful agencies will be made to conduce to peace among the nations and that instead of wreaking measureless havoc upon the entire globe they may become a perennial fountain of world prosperity". Thus we see that the world attention is focussed in harnessing the atom for peaceful purposes in such diverse fields as Industry, Medicine, Agriculture and Research.

The idea of the atom was first suggested by Lucippus but his atomic theory was eclipsed for a long time for want of support. It was John Dalton who remodelled the Atomic theory and put it forward in an agreeable and acceptable form. According to him all the elements were composed of infinitesimal, invisible, indivisible, indestructible and separate particles called Atoms. The word 'Atom' means something indivisible. So the main theme of Dalton's Atomic theory was the indivisibility of the atom.

But this old Daltonian concept of the Atom has changed. Research, both fundamental and applied has shown unambiguously and indisputably that atoms are divisible into simpler fragments or even into the fundamental particles of matter. Atomic energy results from the division of atoms of some heavy elements like Uranium, Plutonium into simpler fragments. Thus when an atom of Uranium 235, is bombarded by a slow moving neutron, the atom greedily absorbs the neutron and is converted to its poor shortlived daughter Uranium 236 which cracks instantly within millionths of a second and undergoes the atomic fission giving the fragments of simpler elements and a few neutrons. The neutrons liberated as a result of atomic fission, strike fresh atoms of Uranium in their turn and cause a self propagating and interpenetrating chain reaction of Atomic fissions. During this chain reaction some mass is converted into energy and this is the principle of the release of Atomic energy.

Energy is also released as a result of nuclear fusion of light nuclei like Hydrogen or its isotopes. Denterium and Trilium to form the Helium nucleus. In nuclear fusion also some mass is converted into energy. Since nuclear fusion involves the fusion of nuclei of identical electric charge, the force of repulsion between the nuclei must be overcome by increasing the kinetic energy of the nuclei. This is effected by the influence of very high temperatures of the order of millions of degrees. Such a reaction is called thermonuclear reaction. This is the principle of the release of energy in Hydrogen bomb

In the Atom bomb the mass of the fissionable material must exceed the critical mass. It was shown by Dr. Fermi that if the critical mass was not exceeded then the Atomic energy could be got at a controlled rate and a predetermined temperature. This was the capital and epoch-making contribution of Dr. Fermi which has immortalized him in the field of peaceful uses of Atomic energy. Atomic energy is brought under control in what are

called Atomic piles or Nuclear reactors. The principle of release of energy is the same both in the Nuclear Reactor and the Atom bomb. A Reactor consists of thin uranium 235 rods an inch in diameter encased in Aluminium to prevent oxidation. These are embedded in graphite blocks. Graphite is the moderator; it moderates the speed of neutrons. The graphite blocks with uranium rods are called the 'Live' and are arranged with 'dead' graphite blocks alternately. There is also a neutron source to initiate the chain reaction. The whole is encased in a vessel of lead and concrete. The chain reaction is controlled by cadmium bars inserted. The above type of Reactor is in Chicago University laboratory. In Agonne the nuclear reactor contains heavy water as the moderator. In Los Almos, the famous homogeneous "water boiler reactor" using uranyl nitrate solution in heavy water is employed.

These Reactors are machines for converting Atomic energy into forms that can be used for peaceful purposes. The Atomic energy has been transformed into electrical energy. In Russia an industrial electric power station (5,000 K.Watts) has been put into operation by Atomic power on July 27, 1954 and electricity has been generated for use in industry and agriculture. Robert Saunders, the Chairman of AEC in America has stated that the Ontario Hydro would be generating electricity by atomic power before the end of 1957. The Westinghouse Electrical Corporation of America is contemplating to have a 60,000 K. Watt electrical power station. The charges for electric power generated from Atomic energy have been calculated to be very cheap. It comes to only 0.01 pence per unit as against 0.43 pence per unit for electric power by coal, oil or water.

The Radio Corporation of America has produced a thimble sized battery using Radio Strontium, in which Atomic energy is directly converted to electrical energy.

An industry which may require these reactors is the Plastic industry. Plastics is hardened and rendered more resistant to heat by the Atomic radiations.

Another peace time use of Atomic energy is the driving of locomotives, propulsion of ships and operation of rocket planes. Donald Gordon has promised that soon atomic powered rocket planes will fly the air and atomic engined boats will ply the sea. It is already reported that in America, the submarine Nautilus is propelled by Atomic energy.

One of the most important uses or the Nuclear Reactors is in their employment for the manufacture of Radio active isotopes which are increasingly employed in most of the industries and research laboratories. Elements Iron, Nitrogen, Iodine and Phosphorus which are not normally radio active, became artificially radio active when they are subjected to the radiations of an Atomic pile. These Radio active isotopes are used in Medicine and as Geiger Muller Counter tracers that is, as a label or tag in industries and research. These radio isotopes can be easily detected by using Geiger Muller Counter.

In Medicine Radio isotopes are substituting Radium proper in Radium therapy. Radio cobalt is used in the treatment of cancer. This is Canada's

wonderful gift in the field of Medicine. A Canadian firm holds patents on a portable Atomic X'ray for medical use using a Radio active Thorium isotope as the source of radiation. The Atomic X'ray is said to cost only a quarter as much as the standard X'ray. The third use of the Radio active isotopes in medicine is that they are employed to kill harmful microbiological organisms which cause infectious diseases.

The use of the Radio active tracers in industry should not be underestimated. They are used to find leaks in big pipes, corrosion in chemical tanks, thin spots in sheets of metal, to measure the thickness of materials with absolute accuracy, to study the wear and tear of engines and used in paper mills to control the thickness of the newsprint and a host of other things.

The use of Atoms and Atomic energy in the field of food and agriculture is of exceptional importance. The Radio isotopes have promised more and improved food. In Brook Heven, Singleton has already shown that if the pea-nuts are exposed to atomic radiations, the yield increases by 30%. Oats seeds susceptible to rust become immune to rust when subjected to the radiations of Radio cobalt. Better variety of potatoes was got if the potatoes were exposed to atomic radiations. Milk and canned meat are sterilized by those radiations. Eradication of pest is an important use of Radio isotopes in agriculture. Another important use in agriculture is to determine at what stage of the growing cycle, the plant needs fertilizer most. Radio Phosphorus is employed in this direction. Investigations have shown that the plants Maize, Tobacco, Sugarcane and Cotton are found to take up the phosphotic fertilizer only during the early stages of their growth. This is a valuable information since fertilizer would be wasted if spread late in the season in the soil holding these crops. On the other hand potatoes take up phosphates throughout the growing season. Such investigations could be done by the only method of employing Radio active tracers.

There is hardly any Biochemical Research laboratory which does not use these tracers. Study of Photosynthesis, of the manifold stages of human metabolism, of the amino acids and proteins and of the Viruses, requires the use of Radio tracers immensely. Life cycle of mosquitos and the problem of how a cow produces milk are studied through this method. Adult rats have been fixed up by the Radio isotopes so that they can't reproduce. The last use would be warmly welcomed by the domestic sector.

As regards the energy of the H bomb, at present there seems to be no peace time use except that it may be used to level up hilly regions making them fit for agricultural purposes.

In India a reactor would be erected in the near future. The Government are contemplating to start a fertilizer cum heavy water factory in the Bakra Nangal region. The heavy water is to be used as moderator. The fissionable material available are Uranium to some extent and Thorium in large quantities. The Thorium would be artificially transmuted to uranium 233 which would be used in

the reactor. It is also proposed to start a number of Radio tracer laboratories with the Central Radio tracer laboratory in Pusa near Delhi.

Thus while we had been trembling before the destructiveness of the Atom bomb or its mighty cousin, the Hydrogen bomb or awaiting in open mouthed anticipation the long heralded era of atomic power, the peaceful uses of Atomic Energy have so imperceptibly and inconceivably crept on us that only few could imagine the giant strides that Science has made in this direction. Boundless and bountiful supplies of energy would bring about a transforming change in the modes of human life and would raise the living standards. Thus Atom is not a curse but a blessing; it is not a tomb of failure but a monument of hope. If even with all these Atoms are used for destruction, it is not the Scientist who is to be blamed. The fault lies on Man because it is Man who makes hell out of heaven or heaven out of hell.

A eminent physician, commanding a very lucrative practice was feeling the pulse of a patient.

"Do you remember me, doctor" asked the patient

"No" replied ths physician "but your pulse is very familiar."

Sri Kamaraj Nadar,
Chief Minister, Madras, being
garlanded on his recent visit to our College

Sri Kamaraj Nadar being shown
the Men's Hostel

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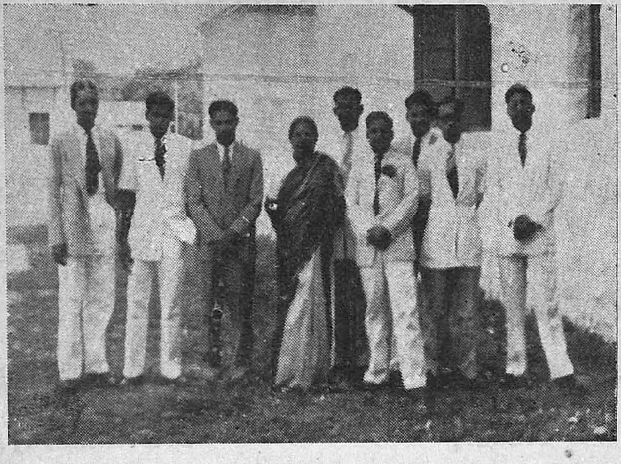
Dr. R. M. Alagappa Chettiar
delivering the presidential address at the
inauguration of the College Union

" Prayer Song " at the
inauguration of the College Union

" ADIEU "



The group of young Doctors who left us, seen with our Principal and Assistant Principal.

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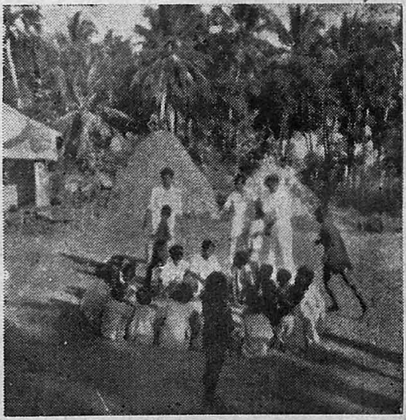
Snaps Taken at our Social Service League Centre.

" A Centenerian "

" Feeding Time "



" Round & Round we go "

[stamp] 16 NOV 1956

DO YOU KNOW ?

By

V. G. Mathi, B. SC.

1. Do you know the systems of Medicine ? What are they ?

2. Who is the Roman Goddess of Wisdom ?

3. Who invented Vaccination ?

4. What is the distance between Karachi and Rameswaram ?

5. When did the England - Australia cricket test match series begin ?

6. Who invented Stethoscopes ?

7. What is symbolized by the colour "RED"?

8. What is meant by Honeymoon ?

9. What is the Emblem of Egypt?

10. What is the duration of the I U.L. period of the elephants ?

11. How can the Ink stain be easily removed from the hands ?

12. Who discovered the action of the vagus nerves ?

13. Who is the President of the Medical Council of India ?

14. Who is God ?

15. In how many years will a Medico finish his course ?

Answers :

1. Allopathy, Ayurveda, Unani, Homeopathy, Hydropathy, Naturopathy, Siddha and Bhootha Vaidyam.

2. Minerva.

3. Jenner.

4. 2153 miles.

5. 1877.

6. Laennec.

7. "RED" stands for anger, violence, and danger; yet the RED CROSS is the Universal sign of human kindness.

8. Honeymoon is the month after marriage or so much of it as is spent away from home. It is so called from the practice of the Ancient.

9. Lotus.

10. 614 days.

11. Ink stain can be removed from the hands by rubbing with the inside of a banana skin.

12. Weber brothers.

13. C. S. Patel F.R.C.S.

14. God is One who resists your desire and leads you as well as the whole Universe, without being resisted.

15. GOD only knows.

"STUDENTS SUPPLICATION"

By

Frank

O Blessed time !: I yearn to have thee stay;
Give unto me whatever joys thou may,
Let passions rise and unknown talents shine,
Let life be young and fair and all divine.

Give me your share of laughter and of fun,
Before this weary course of life is run;
Some simple joy is all I ask to-day,
To cheer me as I go my several way.

Give me a place to sit and learn my book,
A friend or two—a solitary nook;
Let me be kind to those around,
To help another if need be found.

And as the days roll onward, this I pray
That little things to do may come my way;
Then let me do them well is all I ask,
For only once this weary way I pass..

REFLECTIONS

By

G. Raman

When the editor of the College Magazine made a suggestion that it would be a fitting topic if some one could describe one's own reactions on looking into a mirror, for its valued pages, I took him at his word forthwith without realising at the time that it was actually a trap set for me. I magined at the time that the effort was bound to result in Goldsmith's phrase in "something wondrous short" which cannot hold the reader very long.

Having resolved to act, the first thought that assailed me was about Narcissus, the marvellous Grecian youth, who happening to see his beautiful reflection in the water fell in love with it and pined and pined and pined until he fell dead. Could he have known I wondered if the figure inside the water was unsubstantial and a mere shadow of his own outer form. Contemplation regarding this brought up immediately to the surface of my recollection the action of the ancient Korean wife who after taking a peep for the first time in her life into a mirror, treasured by the husband just returned from the capital inside a box and seeing a woman's image (form) promptly concluded it was his second secret wife and went in search of a broomstick. I next thought of the Hall of mirrors - I am not sure if it is in Paris or any other town of France or in imagination only - and of the innumerable reflections and reflections of reflections as far as the eye could reach if I allowed myself on a fine day to stray into its bosom.

I am afraid I am deviating from the task set by the editor. I am merely to look into a mirror and to reflect on the reflection within. That shadow in front without any substance does not interest me at all. It has grown so stale and unprofitable. However what does interest me is what the editor conld have meant by offering me this problem puzzling. I feel there is a catch somewhere and let me try to unravel and find out.

Applying my mind's eye to the task I see a vast panorama of visions of fact and reality passing in front of me. There had always been a prevailing impression that the mirror was an invention for the exclusive benefit of woman and not of man. It was her prerogative to handle it and to use it and to exploit it to the utmost. I wish it had fallen to the lot of one of my sisters to deal with the subject. It should certainly have received a subtle and rare and in every way a better treatment at her hands. As it is however the burden has fallen on my pate, poor pate, worthy of a better fate.

From time immemorial up to the present day Eve has paid more attention to her looks than Adam. At home the college girl often reads a page and then gazes at herself in the glass. Her country cousin dresses herself in a new sari and admires it and her own features reflected in a mirror. For a mere lad like me to speak about woman's dress is perhaps brave. I am to do what the editor has bidden me

to do, to reflect. I have noticed something curious about the Saris of Indian ladies. They are worn differently in different parts of the country. Some ladies put them over their heads, others don't. Some put them over one shoulder, some over another and some over both. Some wind them one way, some another. In colour they are more varied than the hues of a rainbow or the flowers of the field. But all Indian ladies who wear the Sari have one characteristic in common, they wear the Sari gracefully whether worn by the Coolie in the field or the Rani in her palace. Sari is a symbol of grace and gentleness. The character of Indian heroines is told in many a tale of devotion and fortitude and in her Sari she is the perfection of modesty.

Am I digressing? What has woman to do with one's own image in the mirror? The mirror always shows the opposite of things, left right and right left. Don't you see? Be that as it may even if it be a fault it isn't mine but the editor's. I have heard it said that when one begins to really think everything is at stake. I now know it to be so.

These are some of the thoughts that have flitted through my mind on looking into the mirror and though timid by nature, I offer them for what they are worth.

THE PHYSICIAN

There are men and classes of men that stand above the common herd; the soldier, and sailor and the shepherd not infrequently; rather still, the clergy man, the physician almost as a rule. He is the flower (such as it is) of our civilization, and when the stage of man is done with, and only to be marvelled at in history, he will be thought to have shared as little as any in the defects of the period, and most notably to have exhibited the virtues of the race. Generosity he has, such as is possible to those who practise an art, never to those who drive a trade; Discretion tested by a hundred secrets, Tact tried in a thousand embarassments, and what is more important, Herculean cheerfulness and courage, so that he brings air and cheer into the sickroom, and often enough, though not so often as he wishes,—brings healing.

—*Robert Louis Stevenson*

RAMAN EFFECT AND ITS APPLICATIONS IN CHEMISTRY

By

S. Ramakrishnan, M. A.

During the Silver Jubilee of Raman Effect two years back Prof. Einstein, the greatest mathematician of all time paid the best and fittest tribute to Prof. Raman and his contribution. According to him, Prof. Raman is head and shoulders above any other Indian scientist. That is because, it was Raman who was the first to recognise and demonstrate that the energy of a photon can undergo a partial transformation within matter - a discovery of utmost importance in fundamental Research.

In his memorable lecture given before the South Indian Science Association at Bangalore on 16th March 1928, Prof. Raman described his discovery on 'A new type of secondary radiation' which he had discovered a few days earlier at the laboratories of Indian Association for the cultivation of Science, Calcutta. That discovery won for him the universal applause and acclamation of the scientists all over the world for its fundamental and far-reaching nature and later for its various and multifarious applications in Science and Industry, Technology and Biology. As Prof. Richardson remarked, there was hardly any actor in the stage of scientists who did not take part in the chorus of appreciation of Raman effect.

Thus Raman effect came into scene as a result of the patient and persistent work of Raman in collaboration with other scientists, - Professors Krishnan, Ramanathan, Bhagavantham etc. Because of its universality in nature and applicability in the three states of matter it opened a very wide field for research. - Hibben, Carbannes, Allen, Richardson etc.–scientists abroad took up the work and in the short span of about 25 years, more than about 4000 papers have been published on this subject,

Raman effect thus marked an era in the progress of science in general and Modern Physics in particular especially because it provided perhaps one of the most convincing justifications for the Quantum Theory of Radiation put forward by Planck and extended by Einstein according to which a body can give out or take up energy only in integral multiples of a definite amount.

Raman effect is a phenomenon which occurs when light is scattered by matter of any kind - solid, liquid or gas. Molecules which are the minute particles of which every substance is composed can act as scattering centres. Raman effect is a specific and characteristic change in the frequency of light introduced during light-scattering by molecules of substances in solid, liquid or gaseous state.

The phenomenon of scattering is known for a long time. Scattering of X'rays and gamma rays is known as Compton effect. Raman effect is in fact an optical analogue of Compton effect. Scattering of light itself was known by Smekal, Lallemand, Landsberg and Mandelstam. That is why Raman effect is even called Smekal-Raman effect. Scattering of light in gases was

known even in the last century. Lord Raleigh in his reasoning for the blue colour of the sky, interpretted that it was due to the scattering of sun's rays by molecules of air. Raman himself remarks that he drew his inspiration from Compton effect and Raleigh's interpretation of the blue skies. He observes that "the inspiration for this scheme of research was derived in the first instance from Raleigh's well-known theory of the blue sky and the hope that our laboratory studies would furnish a solid experimental basis for the explanation of such natural processes as the colour of the sea and the colour of ice in glaciers. It soon became clear that from our experimental results that the work taken up by us would go far beyond the restricted purpose and lead us to most valuable information about such fundamental problems as the constitution of solid and liquid states, structure and optical properties of molecules and the nature of radiation itself".

The greatness of Raman effect lies in Raman's Concept of a new type of secondary radiation. He observed that during scattering the colour of the light itself is altered (in most cases) by the molecules. This change in colour attending the scattering of light is what is known as Raman effect.

Now the question arises why colour is changed due to scattering ?

According to modern ideas of Quantum Theory of Radiation, a beam of light is supposed to be propagated through space in what are called energy quanta or photons which are not propagated continuously but in integral multiples of definite amount. The photons decide the colour of the light. Different colours have got photons of different energy.

When a photon hits a molecule, it may be scattered without change of energy or it may give up a part of its energy to the molecule and be scattered with less energy. In rare cases it may also absorb a certain amount of energy from the molecule and be scattered with more energy. Where the energy of a photon does not change, no colour change occurs, but where there is energy change, the colour is altered towards the red or violet end of the spectrum One point to be noted here is that there is no question of exchange of energy between the molecules and photons. Each molecule has a scheme of energy levels peculiar to it and it can either accept or give up an amount of energy equal to what is needed to transfer from one level to another. Obviously, therefore, if we can measure the changes in the energy of the photons due to scattering, we obtain at once the scheme of energy levels of the molecules. In order to be able to measure the change in energy of the photon, it is clearly necessary to use only photons of definite energy to start with i.e. a single coloured light.

When the spectrum of such light (monochromatic) is examined it consists only of a small number of sharp lines. But when the light falls on a liquid or any other substance and the scattered beam is examined (usually at right angles) a number of new lines is seen and these new lines are called Raman lines; the spectrum as a whole is called Raman spectrum, which is specific and characteristic of the scattering substance. By finding the difference between the energy of these Raman lines and that of the initial lines due to incident light, the energy levels of the molecules of the scattering substance can be obtained.

To put Raman effect in physical language, when the molecules of solid, liquid or gas are irradiated with monochromatic light that is light of definite frequency, the quanta of energy or photons of light interact with the molecules and a part of their energy may be distributed throughout the molecules in their vibrational and rotational degrees of freedom. Energy not used in these vibrational and rotational excitations is scattered from the molecule as light of different frequency. Thus additional lines of altered frequencies are seen. The additional lines are characteristic of the scattering substance. This displacement or alteration of frequency is called Raman effect.

If Vi is the frequency of the incident light and Vs that of the scattered light then by the Quantum theory the energy associated with the incident and the scattered rays is hvi and hvs respectively. The energy differenca which has been presumably transferred to the molecule of the substance is equal to h (Vi – Vs). The frequency difference Vi – Vs = $\triangle$V is called Raman frequency.

The mechanism of Raman effect is based on Quantum Mechanics. A molecule is in a level A with energy represented by E_A, absorbs the incident radiation and is thereby raised to a level C in which its energy is E_C which is equal to E_A + HVi. The molecule then emits the Raman scattered radiation of frequency Vs and in so doing it falls to an intermediate level B wherein its energy E_B is equal to E_C – HVs. Therefore the net gain in energy is $E_B - E_A$ = h (Vi – Vs) = h $\triangle$V.

The first application of Raman effect is the elucidation of molecular architecture. An examination of Raman spectra of many compounds has shown that h $\triangle$V is almost invariably, equal to the change in rotational and vibrational energy of the molecule. Hence the information obtained from Raman spectra helps in knowing about the vibrational and rotational levels of the molecules and thereby in the elucidation of the molecular structure. The vibrational and rotational transitions give a band of spectrum which lies mainly in the near infra red. A diatomic molecule has only one set of such bands whereas for a polyatomic molecule several sets are observed. From the sets of bands one can have an idea about the modes of vibrations of the molecules and from the modes of vibration, the molecular comflexity can be unravelled as to whether the molecule is diatomic or triatomic etc. and as to how the atoms are arranged in the molecule steriochemically. Thus from the study of Raman spectra it has been shown that molecules of water, Hydrogen sulphide, Sulphur-di-oxide etc. are triangular those of Ammonia are pyramidal and those of phosgene, thionyl chloride are Y shaped.

The second application of Raman effect is to have an idea of the Interatomic distances. If a molecule is regarded as a simple harmonic oscillator, its energy is restricted by quantum considerations to integral multiples of hv. From an equation relating the frequency (V) and the moment of inertia of the molecules (I), the latter can be calculated. The moment of inertia of a molecule if related to the interatomic distance (d) by the equation

$$I = \frac{m_1 m_2}{m_1 + m_2} \times d2.$$

where m_1 and m_2 are the masses of the atoms involved. Thus the interatomic distance (d) in a molecule can be calculated. Using this the internuclear distances in Hydrogen chloride, Benzene etc. have been calculated.

A third application of Raman effect in Chemistry is knowing the strength of linkages. From Raman spectra, the force constants i.e. the Restoration force per centimeter in the molecule can be calculated. These force constants give the relative magnitudes of the forces involved in the various chemical valency bonds and thereby the strength and multiplicity of linkages. The force constant is proportional to the number of valencies i.e. the number of electron pairs shared by 2 atoms. This apparently holds good whether the electrons are shared equally as in a co-valent bond or whether one provides more than the other i.e. the co-ordinate bond thus showing that there is really no fundamental difference between co-valency and co-ordinate co-valency.

Not only the strength of linkages but also the nature of groups present in the molecules could be known since particular groups have fixed force constants. Thus force constants can be employed to know whether the molecule has a c—c or c=c or c≡o etc.

There is also a direct method of identifying functional groups by Raman spectra which could be used as a finger print. The characteristic frequencies of Raman lines gave a direct knowledge about the bond multiplicity and the functional groups. The organic compounds containing the links noted below produce lines in the Raman spectrum with frequency displacements noted against each.

Links.	Frequency Displacement.
c—c aliphatic	990 cm^{-1}
c—c aromatic	1580—1620 cm^{-1}
c=o acid	1650 cm^{-1}
c=o keto	1710 cm^{-1}
c=o aldehyde	1720 cm^{-1}

Thus Raman spectra are used in the identification of groups.

Multiplicity of the linkages also can be known from the frequencies. Thus

Link	Frequency,
c—c	800—860 cm^{-1}
c=c	1600—1650 cm^{-1}
c≡c	2100—2250 cm^{-1}

So we know from the frequencies whether there is a single bond, double bond or triple bond. Thus Raman spectrum is a tool in the study of molecular structure. In fact a final verdict was given about the much debated structure of benzene by Ingold school only after using Raman spectra. This application is particularly useful in the analysis of complex mixtures of Aromatic, Olefinic, Paraffinic and Cycloparaffinic Hydrocarbons, Mineral oils and various isomers. The study of isomers is of industrial significance since the Petroleum industry deals with it. Detection, estimation and even separation of various substances have been effected in cases of saturated and unsaturated hydro carbons halogen derivatives, alcohols, ethers, aldehydes, ketones, heterocyclic and homocyclic compounds.

Raman effect is useful in crystal study also. It furnishes information

about the different kinds of formation of crystals dealing more with dynamical behavier, the strength and nature of the forces that hold the atoms together in a crystal, the frequencies with which they oscillate when disturbed from equilibrium positions etc.

Much light has been thrown by Raman effect on Nuclear Chemistry. It gives information about the spin of the Nucleus of various atoms. Raman spectra have shown that Nitrogen Nuclei follow Bose-Einstein statistics which in turn show beyond doubts that electrons cannot be present in the nuclei. This is a conclusive piece of evidence to show that atomic nucleus consists of protons and neutrons and not electrons.

The idea of Resonance - both electron - exchange hybridisation and the bond - multiplicity hybridisation - has been substantiated by Raman spectra by the bond length determination.

Thus, though the Raman effect is a property owned by Physics, the right of enjoyment seems to be with Chemistry. According to Carbannes Raman effect is one of the most beautiful presents from Physics to Chemistry. Hibben observes that 'Raman effect began as the stepchild of Physics but as time progressed it became the adopted child of Chemistry'. But one can boldly remark without committing himself that Raman effect is not the stepchild but the dear son or daughter 27 years old of the parents Physics and Chemistry.

A student with a scientific bent of mind was having his first date one evening with a lovely lass, who was also out for the first time with a boy. After a short stroll the couple sat on the doorstep of the girl's house and an embarrasing silence followed, the young man not knowing whether to give vent to his feelings or not. He turned and looked at her and saw the carotid artery pulsations were visible at her neck. He took her in his arms. Six months latter after their university course was over, they were happily married.

ANNUAL REPORT OF THE MADURAI MEDICAL COLLEGE ASSOCIATION

The Madurai Medical College Association was inaugurated on the 6th of September 1954, when Dr. Rm. Alagappa Chettiar, M.A., D.LIT., LL.D., Bar-at-Law, delivering the inaugural address exhorted the medical students embarking on an eventful mission of service to humanity, to keep as their watch-word the oft quoted saying of Mahatma Gandhi 'To wipe every tear from every eye'. Dr. (Smt) Sarah J. Souri, MBBS., DGO., PH.D., the Principal presided.

At an earlier meeting held on 13—8—54 the scope of the activities of the association was decided on and the office-bearers for the various posts elected. It was decided to have the following branches as parts of the association.

1. General Association.
2. Fine Arts Association.
3. Social Service League.
4. Athletic Association.
5. Magazine Association,

And the office-bearers were elected as follows:—

President: Dr. (Mrs) Sarah J. Souri, MBBS., PH.D., DGO.

Vice-President: Dr. T. Narayanaswami, MBBS.

Treasurer: Capt. A. N. Ramanathan, B.A., MBBS., DCLS., M.SC.

General Secretary: Mr. E. Gunaseelan.

Day Scholar Representative:
Mr. Samuel V. Srinivasan.

Lady Representative:
Miss. N. Vijayalakshmi.

Fine Arts Association:

Vice-President: Dr. S. T. Sundararaj, MBBS.

Secretary: Mr. J. R. Samiah.

Lady Representative:
Miss. V. Sangeetham.

Magazine Association.

Vice-President: Prof. C. Venkataramiah, MBBS., M.SC.

Secretary: Mr. M. Y. Sankaran.

Editor: Mr. F. J. Rayen.

Athletic Association.

Vice-President: Dr. David Rajaratnam, MBBS.

Secretary: Mr. A. Haiyoom.

Lady Representative:
Miss. V. Rukmani.

Social Service League.

Vice-President: Dr. K. Arumugam, MBBS.

Secretary: Mr. S. V. Rajakumar.

Lady Representative: Miss. J. Saroja.

Under the auspices of the association a meeting was conducted under the presidentship of Professor C. Venkata Ramiah, MBBS., M.SC., the then Professor of Physiology when Major P. Govinda Rao, MBBS., F.R.C.S., (Edin) Honorary Surgeon, Erskine Hospital, Madurai, delivered a lecture on "Chemotherapy and Antibiotics".

The "United Nations Day" was celebrated on 10th November 1954 and Mr. C. S. Krishnan, M.A., M.COM., LL.B., Professor of Commerce, Madura College, Madurai, addressing the students on the United Nations Day, detailed the various achievements of the United Nations for the common good of humanity ever since the inception of the world body.

The Social Service League of the Association was inaugurated on 29th November 1954 by Srimathi Pushpa Natarajan, under the presidentship of the District Collector, Madurai. A village by name Sambanoor Alangulam 3 miles from here was chosen at the suggestion of the District Collector for rendering Social Service by way of educating the inhabitants in fundamentals of hygiene and public health, rendering simple medical aid, and teaching handicrafts. Groups of students were sent on Sunday in vans to render such social aids.

The Athletic Association conducted the annual sports on 19th March 1955 under the Presidentship of Mr. S. Rengarajan, M.L., District Judge, Madurai. Dr. (Mrs.) Sarah J. Souri, MBBS., DGO., PH.D., Principal took the salute and declared the meet open. Mrs. Rengarajan distributed the prizes.

The Fine Arts Association staged entertainments on the Inauguration Day of the Association and contributed in a very large degree to the success of the function. Under the auspices of the fine arts association films "Aureomycin" and "Operation Health" were shown on 6th October - films were also shown by Nutritional Health Officer.

The inaugural number of the Madurai Medical College magazine is shaping beautifully and will be ready in a few days. The guidance and direction of the Principal and the enthusiasm shown by the Vice-Presidents has worked a long way in the execution of the duties assigned to the assocication.

Besides the special activities mentioned above the routine business meetings were held as under for election of office-bearers in place of those who left us in the midst of this academic year.

On 16—11—54 a meeting was held to elect the Vice-President for Social Service League in the place of Dr. K. Arumugam, MBBS., and Dr. M. Muthu, MBBS., was unanimously elected as the Vice-President.

At a meeting held on 12-2-1955 Dr. T. Narayanaswami, Vice-President presiding, Dr. K. P. Anandan, MBBS., M.SC., Professor of Physiology was elected as Vice-President of the Magazine Association unanimously.

Mr. Babu Bryant was elected as the Secretary for the Social Service League following the transfer of Mr. S. V. Rajakumar to the Stanley Medical College.

The members of the Association had the rare opportunity of receiving Sri K. Kamaraj Nadar, Chief Minister on 21-11-1954.

Sri C. Subramaniam, Minister for Finance, Education and Food, Madras State visited the College and addressed the students on 3-1-1955.

On 27-1-55 Dr A. D. Mukherji, Minister of State, in chargr of Medical and Public Health, Government of West Bengal visited the College and addressed the students.

On 28-1-55 Sri Misra, Health Minister of Bihar also visited the College.

All the fifty students of the College constituted themselves into a volunteer corps under the leadership of Dr. G. A. Naidu, and Dr. T. Narayanaswami on the occasion of the Ninth Madras State Medical Conference held at our campus on 20th and 21st November 1954.

Farewell meetings were held following the transfer orders of the following staff members:—

Prof. C. Venkataramiah, Dr. Kesavan, Dr. S. T. Sundararaj, Dr. Alikutty, Dr. K. Subramaniam, Dr. N. S. Ramachandramurthy and Mr. R. Subramaniam.

On the 14th February the Rotary Club, Madurai conducted an elocution contest open to all local College students. Mr. Sankaran was sent as our representative.

The activities of this association and its various branches would have been many more and of a higher order but for the fact that this College is a new set up, a premature babe ushered in under none too congenial circumstances. The time and energies of the staff members who have been unstinting in their co-operation and guidance in the various extra curricular activities of the students of this College have been taken up much in their hard and strenuous endeavours, they had to undertake to overcome the handicaps and establish the College on "terra-firma" of sound traditions. The enthusiasm of the first 'fifty' has always received the merited encouragement from them and many a good tradition is well on the way for this infant institution and this association looks forward for a more active and eventful year ahead.

" OVER THE BAR "

" WINNERS "

Champion Athletic C. D, Clement

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" ALSO RAN "

CONNE...
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ANNUAL COLLEGE SPORTS.

The first annual College Sports meet was held on the 19th March 1955 with great pomp under the Presidentship of Sri S. Rangarajan, M.L., District Judge, Madurai.

The success of the meet is of more than ordinary significance. The College was allotted a piece of land north of the Collector's Office to be used as play ground. This "ground" was strewn with thorny shrubs and with pits which gave one the impression that the area was subjected to enemy bombardment during the last war. Little did we think that a sports meet of any kind could be held there without incurring a heavy expenditure on levelling it. Nevertheless, we were determined to hold the meet during the month of March itself. Official machinery for levelling the ground would involve delay of not less than 6 months. We decided to undertake the task ourselves. The students of the College under the personal supervision of our versatile Principal, Dr. (Smt.) Sarah J. Souri and other members of the staff assisted by a willing band of workers made up of clerks, laboratory attenders and others got down to the job of clearing the ground. Within a week the ground was changed beyond recognition and it was possible to lay out a fairly decent 200 meter track much ahead of schedule. The part played by the girl students of the College in this strenuous but dignified task is worthy of special mention.

On the day of the meet the ground presented a colourful spectacle with arches, pandals, flags and festoons. The programme began with a march past by the atheletes when our Principal, Dr. (Smt.) Sarah J. Souri took the salute and declared the meet open.

The various items were gone through with clock like precision. The performance of the students, both boys and girls, was nothing to be ashamed of. In fact, we are confident that some of them may be wearing university colours in the near future. C. D. Clement emerged out a very popular champion Our congratulations to him.

We are grateful to Srimathi Rangarajan for distributing the prizes to the winners. Following are the detailed results:

MEN.

100 Metres:—

S. D. Clement
K. P. Mathew
S. G. Palaniappan.

200 Metres:—

S. D. Clement
J. R. Samiah
S. G. Palaniappan

400 Metres:—

G. Chandragraham
F. J. Rayen
P. Andiappan.

800 Metres:—

G. Chandragraham
P. Andiappan
A. Devadoss.

High Jump:—

Vijayarengan
S. D. Clement
F. J. Rayen.

Long Jump:—

Vijayarengan
J. R. Samiah
K. Kumarasamy.

Hop, Step and Jump:—

J. R. Samiah
Vijayarengan
S. Jamal.

Discuss Throw:—

V. Kandasamy
A. Haiyoom
K. P. Mathew.

Javelin Throw:—

K. P. Mathew
S. Jamal
C. Thangaraj.

Putting The Shot:—

V. Kandasamy
S. D. Clement
S. Thangasamy.

4 × 100 Metres Relay:—

1. Mathew's Team:

V. R. Rajendran
K. Kumarasamy
F. J. Rayen
K. P. Mathew.

2. Clement's Team:

M. R. Muthiah
A. Haiyoom
S. G. Palaniappan
S. D. Clement.

Individual Championship:—

S. D. Clement (16 points)
Vijayarengan. (13 points)

WOMEN.

75 Metres:—

Vijayalakshmi
K. Kamala.

50 Metres Skipping:—

Vijayalakshmi
K. Kamala.

Net Ball Throw:—

Sivagami
Rukmani.

Obstacle Race:—

Sivagami
J. Saroja.

Three-Legged Race:—

Vijayalakshmi and Rukmani
Sangeetham and Kamala.

Fancy Dress:—

C. Thangaraj (Waiter)
G. Mathiprakasam (Bangle Seller).

Results of Intra-College Team Tournaments.

MEN.

Badminton-Fives.

WINNERS:—

A. Haiyoom (Capt.)
G. Mathipragasam
P. Andiappan
V. R. Rajendran
F. J. Rayen.

Badminton-Doubles.

WINNERS:—

Vijayarengan and S. D. Clement.

Volley-Ball.

WINNERS:—

V. Kandasamy (Capt.)
A. Haiyoom
K. Ramasamy
K. Kumarasamy
S. Rajendran
C. Thangaraj.

Tennikoit-Doubles.

WINNERS:—

G. Chandragraham and
S. G. Palaniappan.

WOMEN.

Tennikoit-Doubles.

WINNERS:—

Rukmani and Vijayalakshmi.

Badminton-Doubles.

WINNERS:—

Vijayalakshmi and J. Saroja.

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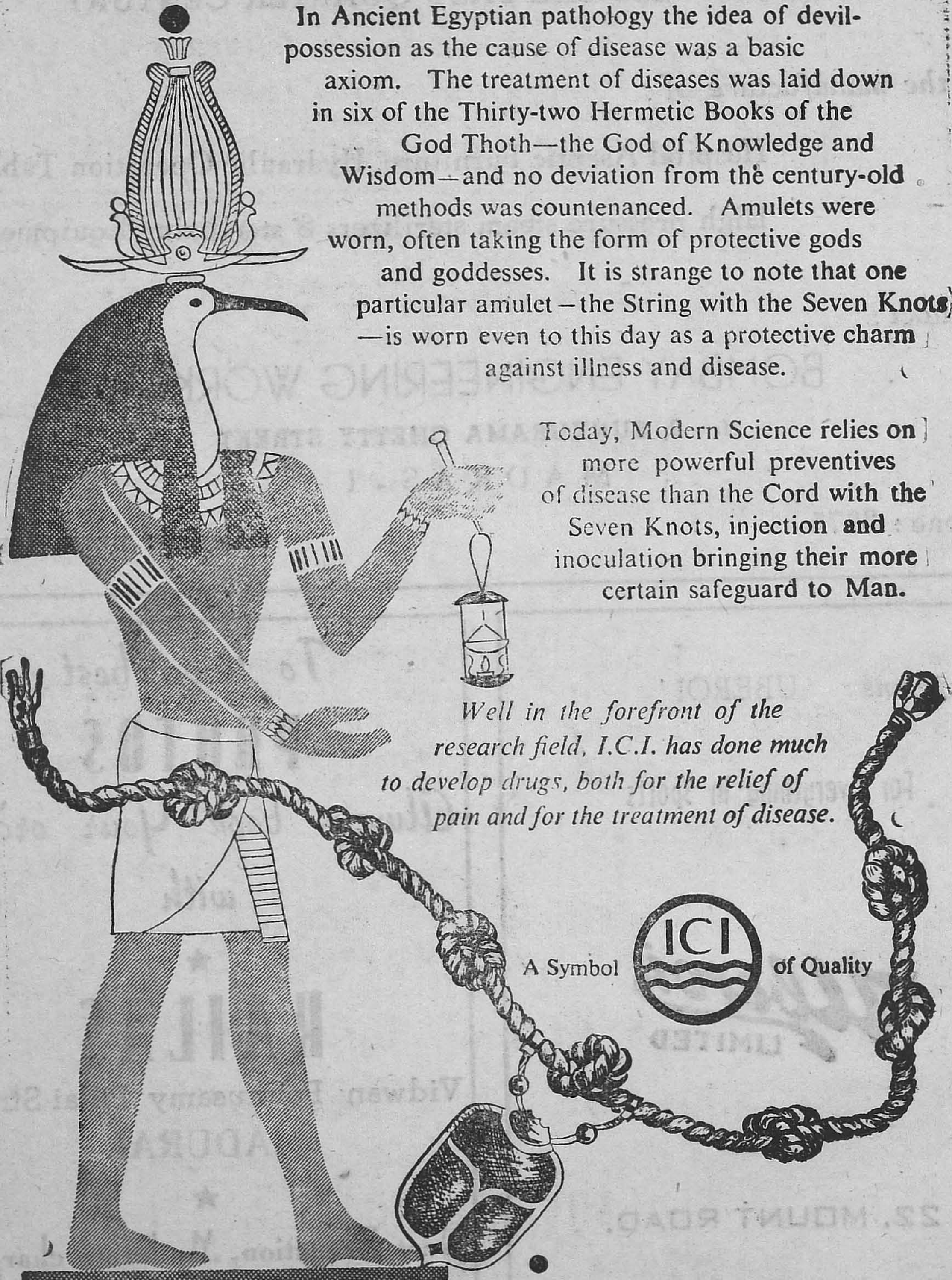

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